The Dark Side of Artificial Intelligence: Understanding Its Impact on Customer Engagement in the Financial Services Sector in Egypt

Dr. Aisha Tarek Noour

Assistant Professor at Marketing and International Business Department,

College of Management and Technology (Alexandria Branch),

The Arab Academy for Science, Technology and Maritime Transport (AAST&MT)

Egypt, Alexandria, Miami.

Aishenoour@aast.edu

ABSTRACT:

Purpose: The study investigated the impact of the dark side of Artificial Intelligence (AI) on customer engagement with brands through the mediator role of affective responses, behavioral responses, and cognitive responses and the moderator role of customer technostress to fill this gap by applying the study on the financial services sector in Egypt.

Design/Methodology: The study adopted a positivism philosophy, a deductive approach, and a quantitative research design, the study distributed 830 questionnaires to Egyptian bank customers who have made interaction with AI-based services, such as chatbots, auto-loan approvals, and AI-based investment recommendations, with 545 valid responses used for analysis. The study employed Structural Equation Modeling (SEM) and correlation analysis to examine the topic studied.

Findings: The results indicated that the relationship between Darkside of AI and customer engagement with brands was partially supported. In addition, the mediation role of cognitive responses on the relationship between Darkside of AI and customer engagement was partially supported. Moreover, the mediation role of behavioral responses on the relationship between Darkside of AI and customer engagement was partially supported. Furthermore, the mediation role of affective responses on the relationship between Darkside of AI and customer engagement was partially supported. The results revealed that the role of customer technostress in the relationship between Darkside of AI and customer engagement as a moderator was partially supported

Keywords: The Dark Side of AI, Customer Engagement, Financial Services Sector, affective responses, behavioral responses, cognitive responses, customer technostress.

1. Introduction

Artificial Intelligence (AI) applications in the service industry have expanded significantly in recent years, as applications have extended from front-end interactions with customers to managing relationships with them (Prentice *et al.,* 2020; Uysal *et al*., 2022). Unlike the third industrial revolution, which was characterized by adopting smart and independent systems based on data and machine learning, the fourth industrial revolution is characterized by communication between machines, which allows the system to makes without human intervention (Fickers, 2023; Yeo *et al.,* 2022; Uyal *et al.,* 2022). As a result, automation has become the main component of the digital transformation that is occurring in many industries AI plays a pivotal role in developing marketing strategies that generate value for shareholders (Gao *et al.*, 2023).

Despite the advanced strategies carried out by AI, some challenges and negatives associated with the use of AI in the lives of customers have emerged. It is known as the dark-side, where its negative effects have appeared, which may not be immediately visible (Seo and Lee, 2021). The fear of surveillance and privacy violations is one of the most prominent of these effects, as AI can collect sensitive information on customers without their knowledge, which increases concerns about manipulation or personal exploitation (Chen *et al.*, 2023). Psychological and emotional challenges have also emerged regarding AI due to the increasing sense of being ignored by smart systems or even the inability to communicate effectively with these systems (Grewal *et al.*, 2021). Therefore, it seems that AI has failed to understand individual differences or meet the needs of customers personally, which leads to customers' reluctance to use these systems (Puntoni, *et al.,* 2021). Social and communicative effects have also shown that customers may have difficulty interacting with AI due to social and emotional barriers, which reduces their willingness to use this technology (Barari *et al.*, 2024).

Although there are studies on scientists' interaction and engagement with the brand, there is a lack of studies that sufficiently examine how negative engagement appears in interactions driven by AI (Suraña-Sánchez and Aramendia-Muneta, 2024). There is a lack of empirical understanding of the factors that lead to negative engagement among customers after the interaction (Khac *et al.,* 2020). Therefore, this research aims to investigate the impact of the dark-side of AI on

customer engagement with brands through the mediator role of affective responses, behavioral responses, and cognitive responses and the moderator role of customer techno-stress to fill this gap by applying the study on the financial services sector in Egypt. It also is crucial to understanding how these dimensions evolve during interactions and examine the potential outcomes that may result from negative AI interactions and provide practical insights for practitioners in marketing and service organizations on how negative engagement impacts customer perceptions and behaviors (Nguyen *et al.*, 2024).

2. Literature Review

In this section, definitions and research hypotheses are presented by reviewing previous literature that discusses the different relationships between current study variables.

2.1 Conceptual Background
2.1.1 Dark-side of Artificial Intelligence (AI)

The dark-side of Artificial Intelligence (AI) is marked by its ability to infringe on privacy rights and perpetuate biases. The more sophisticated the AI systems become, the greater the likelihood of them being used to manipulate or control individuals without their awareness (Lenca, 2023). Furthermore, reliance on algorithms for decision-making leaves the door open to discriminatory choices that further exacerbate inequalities in society (Kleinberg *et al.,* 2019). Regulations and ethical standards must be put in place to step into these issues and ensure that AI is used appropriately and for the good of all (Mennella, *et al.,* 2024). There is much dark side research in Information System (IS), which tends to concentrate on investigating how AI and analytics can be used to lead to spectacular, out-of-the-ordinary cases (Barari *et al*., 2024 and Barari, 2024). For example, using AI to detect disease could oversight unusual presentations of illness or an outlier; one in a thousand cases would use AI for their own unusual, perverse gain (Mikalef *et al.,* 2022).

2.1.2 Cognitive Responses

Cognitive responses refer to mental processes or ideas that customers go through when interacting with products and services based on AI (Kallel *et al.,* 2024). These responses indicate how customers perceive and evaluate AI technology based on their mental assessment (Barari *et al.,* 2024). Individuals' cognitive reactions can be quite different; they can be extremely comfortable with AI technology or even

uncomfortable and suspicious (Nizamani *et al.*, 2024). Customers' behavior and interaction with AI are influenced by myriad factors, including cultural background, history of experience, and personal values (Jain *et al.,* 2023). Companies must recognize these cognitive reactions so that they can design their AI products based on the varying customers' requirements and tastes (Hajiheydari *et al.,* 2025).

2.1.3 Behavioral Responses

Behavioral responses indicate the actions and reactions of customers towards the offers submitted by companies, especially about AI technologies (Knoll *et al.*, 2017). These behaviors include purchase behavior (Knoll *et al.,* 2017). It determines whether the customer will buy the product or service after interacting with artificial intelligence technologies or loyalty (Singh and Singh, 2024). Customers or commercial marks after their experience of offers based on artificial (Ameen *et al.*, 2023; Farbod, 2024) and well-being that indicates the influence of AI techniques on the emotional and psychological state of customers. It may be positive or negative based on their experiences of these behavioral responses affected by cognitive and emotional responses, including perceived benefit, confidence, position and satisfaction that are formed by factors (Ford et al., 2017), for examples, anxiety about privacy, perceived risks, customer alienation, and exclusivity of uniqueness (Ford *et al.*, 2017, Quach *et al.,* 2022; *Ferm et al.,* 2023).

2.1.4 Affective Responses

Affective Responses play a significant role in determining the overall performance of AI-driven offers in marketing. Positive affective responses like happiness and contentment are more likely to promote higher customer loyalty and repeat purchases (Singh and Singh, 2024). Negative affective responses like distrust or unease, however, can make customers avoid the brand completely (Bigné *et al.*, 2023). Therefore, marketers must take seriously the emotional impact of AI-driven offers among their consumers to optimize campaign performance (Kim *et al.,* 2020). The affective reactions are essential to build a long-lasting and favorable relationship with customers (Gokarna, 2021). Through the activation of the emotional requirements of customers, marketers can establish trust and loyalty, which would ultimately lead to long-term business success for the brand (Pitardi and Marriott, 2021). In addition, the inclusion of emotional intelligence in AI-driven marketing

can create personalized experiences that more deeply engage consumers emotionally (Liu-Thompkins *et al.*, 2022).

2.1.5 Customer Engagement With Brand

Customer engagement with the brand in the era of artificial zakat requires allocating the user's experiences in a way that makes the customer feel that it is distinctive and depends on many brands now on AI systems such as chat robots, voice aids, and recommendations (Ho, 2021). These systems help enhance interaction with the trademark by providing comfortable and fast services. It is appropriate for their own needs, yet if customers feel that these systems think of a deep understanding of their individual needs or that they ignore personal privacy or raise personal concerns related to social isolation or the risks perceived for them, this leads to a decline in interacting with trade signs in general (Barari *et al.*, 2024).

2.1.6 Research Hypotheses Development

Even though the discussion about the dark-side of AI and its impact on customer engagement is growing, it still lacks specific details about how these issues arise and how they can be resolved within the particular operational and interpersonal dynamics of the banking industry (Castillo *et al.*, 2020). Castillo-Martínez *et al.* (2024), and Castillo *et al.* (2020) provided evidence of how service encounters that do not meet expectations by AI can happen through reasons such as authenticity, cognitive barriers, emotive distance, functionality issues, and integration conflicts. While smart, their qualitative results cannot be tested quantitatively and are not appropriate for high-trust environments such as financial services (Lim, 2025).

Siu and his colleagues (2023) reasoned that online consumer engagement can enable empowerment (the upside) or stress (the downside), with perceived brand quality and personality characteristics including extroversion moderating such behavior. This investigation is limited to broad online contexts and does not analyze sector-related suggestions(Al-Debei *et al.*, 2015; García-Contreras *et al.*, 2022).

On quantitative basis, Barari and his colleagues (2024) found that the dark side of AI severely damages customer engagement. However, although their analysis provides hard-pooled lessons, it doesn't show

industry-specific pathways or the ways these negative impacts arise through cognitive, emotional, or behavioral mechanisms.

Nguyen *et al.* (2024) analyzed AI advertising, with its depiction of how poor contextual, representational, and access judgments increase threat perceptions to provoke anger and anxiety. This indicates the cognitive load incurred by AI but within the field of advertising alone, thereby not extending to service interactions and leaving the effect on banking unexamined (Wang *et al.*, 2024). Correspondingly, Barari *et al.* (2024) concluded that the dark AI impacts cognition such as perceived usefulness and trust but sadly did not connect these cognitive intrusions categorically.

In behaviorally responding, both Muslik *et al.* (2025), Barari (2024), and *Barari et al.* (2024) confirm that consumer behavior is significantly affected by the dark-side of AI. Muslik and his colleagues (2025) used bibliometric analysis in charting these impacts, while Barari *et al.* (2024) provided meta-analytic effect sizes. Even with these confirmations, both studies examine behavior as a result, without investigating how resulting changes in behavior tie into broader customer engagement processes, particularly in conservative industries like banking (Ulrich-Diener and Spacek, 2021; Mou *et al.,* 2023).

Regarding emotional responses, Sun *et al.* (2022) established that technical failures in intelligent personal assistant services lower customer satisfaction and continuity intentions through affective fatigue and cognitive disturbance. Cheng and his colleagues (2022) also elaborated on this by conducting a survey on risks of AI in various industries with respect to the need for deeper scrutiny of negative psychological impacts. Nonetheless, these studies are lacking with regard to empirically confirming the mediating role of emotional responses on the relationship between AI issues and bank customers' engagement (Dantsoho *et al.,* 2021; Cheng and Jiang, 2020)

The cognitive impact on customer engagement has previously been reported in other contexts. Ma *et al.* (2022) and Cheung *et al.* (2021) found that brand posts' interactivity and intelligibility activate cognitive, affective, and behavioral engagement, but they didn't address AI-facilitated service environments or the threat of AI-induced cognitive overload (Lahlou, 2025). Likewise, behavioral responses' links to engagement have been established by Sheng (2019), and by Dai and Wang (2021). Nevertheless, these studies omit the potential

disruptive influence of AI's negative attributes on these behavioral pathways (Frater and Mushininga, 2025).

On affective engagement, Tuti and Sulistia (2022) and Chi *et al.* (2021) proved that employee-customer interaction and digital features significantly enhance customer value co-creation and brand satisfaction. Katsifaraki and Theodosiou (2024) also confirmed that service-dominant orientation enhances customer engagement through positive attitudes, whereas Yan *et al.* (2024) witnessed that customer satisfaction is the fulcrum of delivering brand engagement in green hotels. Whereas all these studies relate to affective drivers of engagement, none of them discuss the why regarding the reason that the adverse properties of AI might produce opposite effects, particularly in high-involvement service situations like banking (Suraña-Sánchez and Aramendia-Muneta, 2024)

Previous studies demonstrated that AI's dark-side can lessen customer trust, lead to emotional distress, and make behavioral changes (Barari *et al.*, 2024). All of which are fundamental elements of customer engagement. Most research to date, however, is either nonspecific in terms of industry, applied to non-banking environments, or does not investigate the mediation mechanisms by which AI-generated unpleasantness influences participation (Kučinskas, 2024; Barari *et al.*, 2024). Furthermore, the customer technostress moderating effect a feature set to drive detrimental perceptions of AI has not been given wide exploration in extant literature (Chang *et al.,* 2024).

Accordingly, the present investigation fills these gaps by analyzing how cognitive, affective, and behavioral reactions act as mediators between the dark side of AI and client engagement, particularly in the banking sector. It also analyzes how customer technostress moderates such interactions, making theoretical as well as practical contributions in curbing AI-driven disengagement.

3. Research Gap

The gap in the studies lies in the lack of comprehensive exploration of how the dark side of AI affects customer engagement with the brand by integrating different types of responses: cognitive, emotional, and behavioral, with customer technostress as a moderating factor. While many studies have examined the impact of the dark side of AI on customer responses and their relationships with their engagement with the brand, there is a lack of research that links these responses into a

unified model. In addition, the role of technostress as a moderator of these relationships has not been fully explored. The current literature focuses on isolated aspects such as the impact of AI on cognitive or emotional responses or engagement behaviors, but fewer studies have addressed how these factors interact together in trusting the dark side of AI. There is another major research gap in understanding how these multiple dimensions interact and affect customer engagement with the brand considering AI challenges. It also lies in the fact that most studies rely on theoretical literature without using field or experimental research methodologies. To study the impact of the dark side of AI on customer interaction with the brand, while many studies focus on reviewing the negative effects of artificial intelligence through its theoretical literature, there is a lack of research studies that use research methodologies such as quantitative or experimental analysis to analyze the relationships between different dimensions of responses and the role of technological stress as a moderating factor. Therefore, current study can contribute to bridging the gap by using field research approaches and experimental data to study these relationships more comprehensively and realistically.

4. Research Methodology

The current study adopts a positivism research philosophy, emphasizing objective reality and empirical evidence on which to base findings. A deductive research approach is utilized, where hypotheses are developed from mature theoretical assumptions and subsequently tested by quantitative data analysis (Park *et al.,* 2020).

To effectively assess the impact of the dark side of AI on customers' engagement with brands in an organized manner, the study embraces a quantitative approach to research by using statistical analysis of data techniques. The investigation focuses on the Egyptian banking sector, with its target being Egyptian bank customers who have interacted with AI-based services, such as chatbots, auto-loan approvals, and AI-based investment recommendations.

Data was gathered through a standardized questionnaire survey, filled in by bank customers who had prior experience of availing themselves of AI-based financial services. 830 questionnaires were sent out, of which 603 were retrieved. After data validation, 545 questionnaires were found to be valid for analysis, making available a robust and reliable dataset for hypothesis testing.

For establishing the validity and reliability of the study, a series of statistical tests were executed, such as the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy, Cronbach's alpha internal consistency, Confirmatory Factor Analysis (CFA) to cross-validate the measurement model, and Average Variance Extracted (AVE) to check for construct validity. Normality testing, skewness, and kurtosis tests, and Variance Inflation Factors (VIF) were also conducted to measure data distribution and multicollinearity.

The relationships among the research variables were examined with the help of correlation analysis and Structural Equation Modeling (SEM) based on Statistical Package for the Social Sciences (SPSS) and Analysis of Moment Structure (AMOS) to analyze causal relationships and justify the proposed hypotheses. Following that, the study considers the following primary variables:

- **Independent Variable: Darkside of AI (Privacy concern - Perceived risk -Customer alienation- Uniqueness neglect)**
- **Mediator Variable: Cognitive responses (Perceived benefit, Trust), Behavioral responses (Purchase, Loyalty, Wellbeing), Affective responses (Attitude, Satisfaction).**
- **Moderator Variable: Customer Technostress.**
- **Dependent Variables: Customer Engagement with Brand.**

The following research hypotheses are based on both the prior variables and the study's framework:

- *H1: There is a Significant Relationship Between the Darkside of AI and Customer Engagement with Brands*
- *H2: There is a Significant Relationship Between the Darkside of AI and Behavioral Responses*
- *H3: There is a Significant Relationship Between the Darkside of AI and Cognitive Responses*
- *H4: There is a Significant Relationship Between Darkside of AI and Affective Responses*
- *H5: There's a Significant Relationship Between Cognitive Responses and Customer Engagement with Brands*
- *H6: There is a Significant Relationship Between Behavioral Responses and Customer Engagement with Brands*
- *H7: There is a Significant Relationship Between Affective Responses and Customer Engagement with Brands*

- *H8: Cognitive responses mediate the relationship between Darkside of AI and Customer Engagement*
- *H9: Behavioral responses mediate the relationship between Darkside of AI and Customer Engagement*
- *H10: Affective responses mediate the relationship between Darkside of AI and Customer Engagement*
- *H11: Customer Technostress moderates the relationship between Darkside of AI and Customer Engagement*

According to these variables Figure 1 shows the framework of the current study:
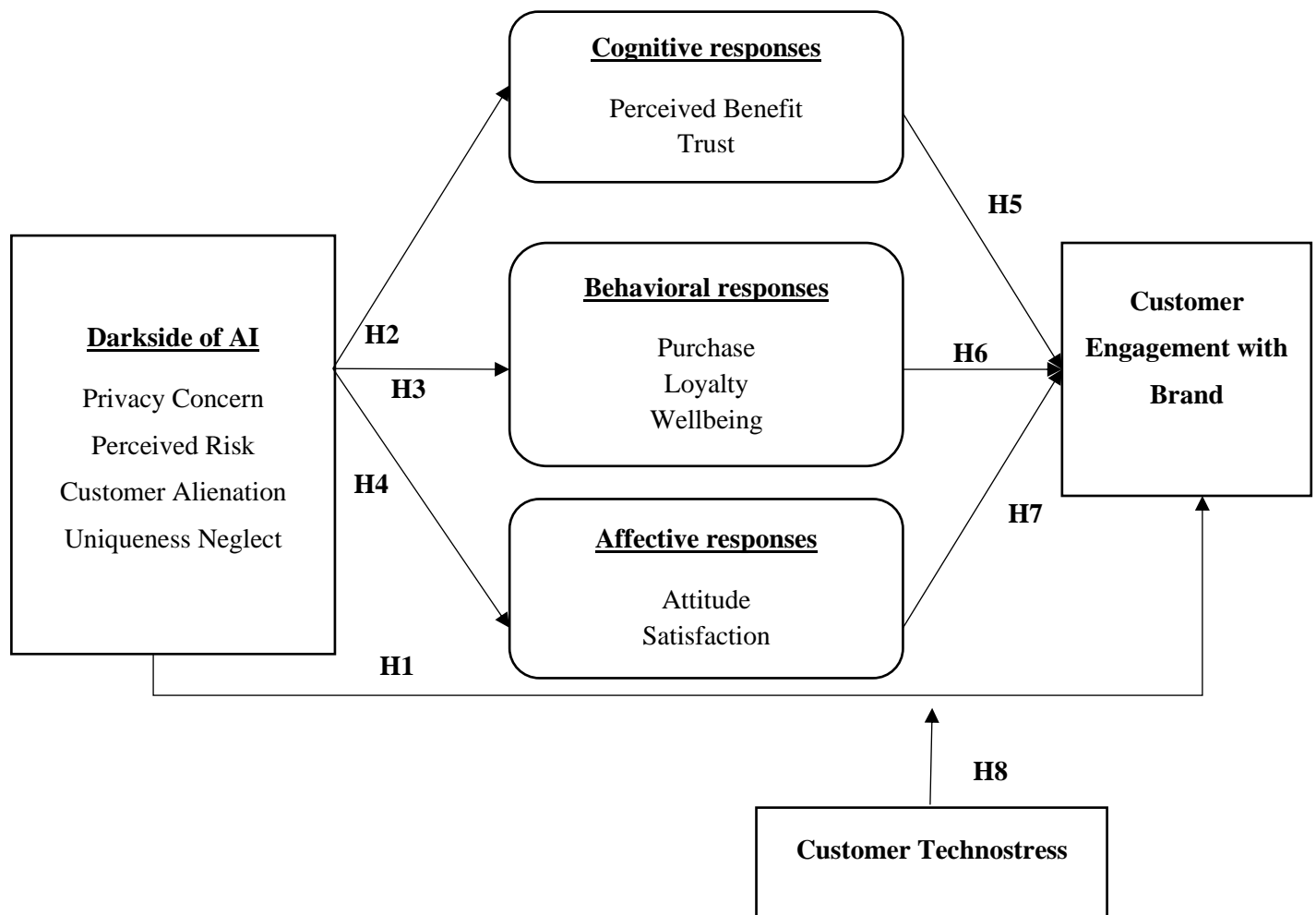

Figure 1: Conceptual Framework

The study investigates the effects of Darkside of AI on Customer Engagement with the Brand through the mediator role of Affective responses and Behavioral responses and Cognitive responses and the

moderator role of Customer Technostress. To test these links, data were collected from customers of Egyptian banks who have interacted with AI-powered services. All constructs were measured using multiple-item scales, with responses captured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Four dimensions were used, which are Privacy (Buchanan *et al.*, 2017), Perceived Risk (Han and Yang, 2018), Customer Alienation (Buchanan *et al.*, 2007), and Uniqueness neglect is based on Han and Yang (2018):

Cognitive responses were measured through two dimensions; Perceived benefit (Han and Yang, 2018) and Trust (Buchanan *et al.*, 2007). Behavioral responses are measured through three dimensions; Purchase (Lee and Leh, 2011), Loyalty (Lee and Leh, 2011), and Wellbeing (Lee and Leh, 2011). Affective responses are measured through two dimensions; Attitude (Quach *et al.*, 2022), and Satisfaction (Han and Yang, 2018).

5. Empirical Study and Findings

This section presents an examination of the research hypotheses, following a structured analytical approach.

5.1 Testing Validity and Reliability

The study ensures construct validity through Average Variance Extracted (AVE) and factor loadings. An AVE value of 0.5 or higher indicates that the construction explains sufficient variance among its indicators, while factor loadings of 0.4 or higher confirm item validity. Reliability is evaluated using Cronbach's Alpha, where a coefficient of 0.6 or above signifies internal consistency and measurement stability. The study's findings, presented in Table 1, indicate that AVE values (56.598%–79.238%) exceed the 50% threshold, while factor loadings (0.494–0.792) surpass the 0.4 minimum requirement. Furthermore, KMO values (0.500–0.824) confirm sample adequacy, reinforcing the constructs' validity and reliability.

Table 1: Reliability and Validity Results

Variables	KMO	AVE %	Cronbach's α	Items	Factor Loading
Privacy Concern	.770	88.823	.937	PC1	.887
				PC2	.891

Variables	KMO	AVE %	Cronbach's α	Items	Factor Loading
				PC3	.887
Perceived Risk	.947	84.471	.963	PR1	.848
				PR2	.835
				PR3	.844
				PR4	.842
				PR5	.857
				PR6	.843
Customer Alienation	.767	87.715	.930	CA1	.877
				CA2	.874
				CA3	.881
Uniqueness Neglect	.761	85.864	.918	UN1	.850
				UN2	.860
				UN3	.866
Perceived Benefit	.775	90.473	.947	PB1	.908
				PB2	.906
				PB3	.901
Trust	.865	84.012	.936	TS1	.831
				TS2	.829
				TS3	.855
				TS4	.845
Purchase	.500	86.148	.839	PUC1	.861
				PUC2	.861
Loyalty	.874	86.565	.948	LOY1	.873
				LOY2	.866
				LOY3	.868
				LOY4	.856
Wellbeing	.922	86.285	.960	WEL1	.858
				WEL2	.873
				WEL3	.861
				WEL4	.861
				WEL5	.861
Attitude	.770	89.468	.941	ATT1	.901
				ATT2	.883
				ATT3	.900
Satisfaction	.772	89.475	.941	SAT1	.890
				SAT2	.897
				SAT3	.896
Customer	.877	87.816	.954	CE1	.882

Variables	KMO	AVE %	Cronbach's α	Items	Factor Loading
Engagement				CE2	.883
				CE3	.876
				CE4	.873
Customer Technostress	.922	86.585	.961	CT1	.865
				CT2	.864
				CT3	.859
				CT4	.866
				CT5	.875

5.2 Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) was conducted using AMOS 24 with the Maximum Likelihood (ML) estimation method to validate the measurement model before applying Structural Equation Modeling (SEM). The model fit statistics indicate an overall good fit. The Chi-square/degrees of freedom ratio (CMIN/DF) was 1.251 with a p-value of 0.000, suggesting statistical significance and minimal discrepancy between the observed and estimated covariance matrices. The Goodness of Fit Index (GFI) was 0.910, indicating that the model explains the observed covariance well, while the Adjusted Goodness of Fit Index (AGFI) recorded 0.895, reflecting an acceptable fit despite being slightly below the ideal 0.90 threshold. The Normed Fit Index (NFI) was 0.965, showing an acceptable fit compared to a null model, and the Tucker-Lewis Index (TLI) reached 0.992, confirming strong model performance. Additionally, the Comparative Fit Index (CFI) was 0.993, supporting the model's strong fit. The Root Mean Square Residual (RMR) was 0.055, indicating minimal differences between observed and predicted correlations, while the Root Mean Square Error of Approximation (RMSEA) was 0.021, suggesting a close fit with minimal estimation error. These results confirm the validity and reliability of the measurement model.

Figure 2 illustrates the execution of confirmatory factor analysis, portraying factor loadings through prominent arrows. The arrows signify strong factor loadings, with values exceeding the 0.4 threshold.

To delve into the specific numerical values of these factor loadings, readers are directed to Table 4 for a detailed examination.
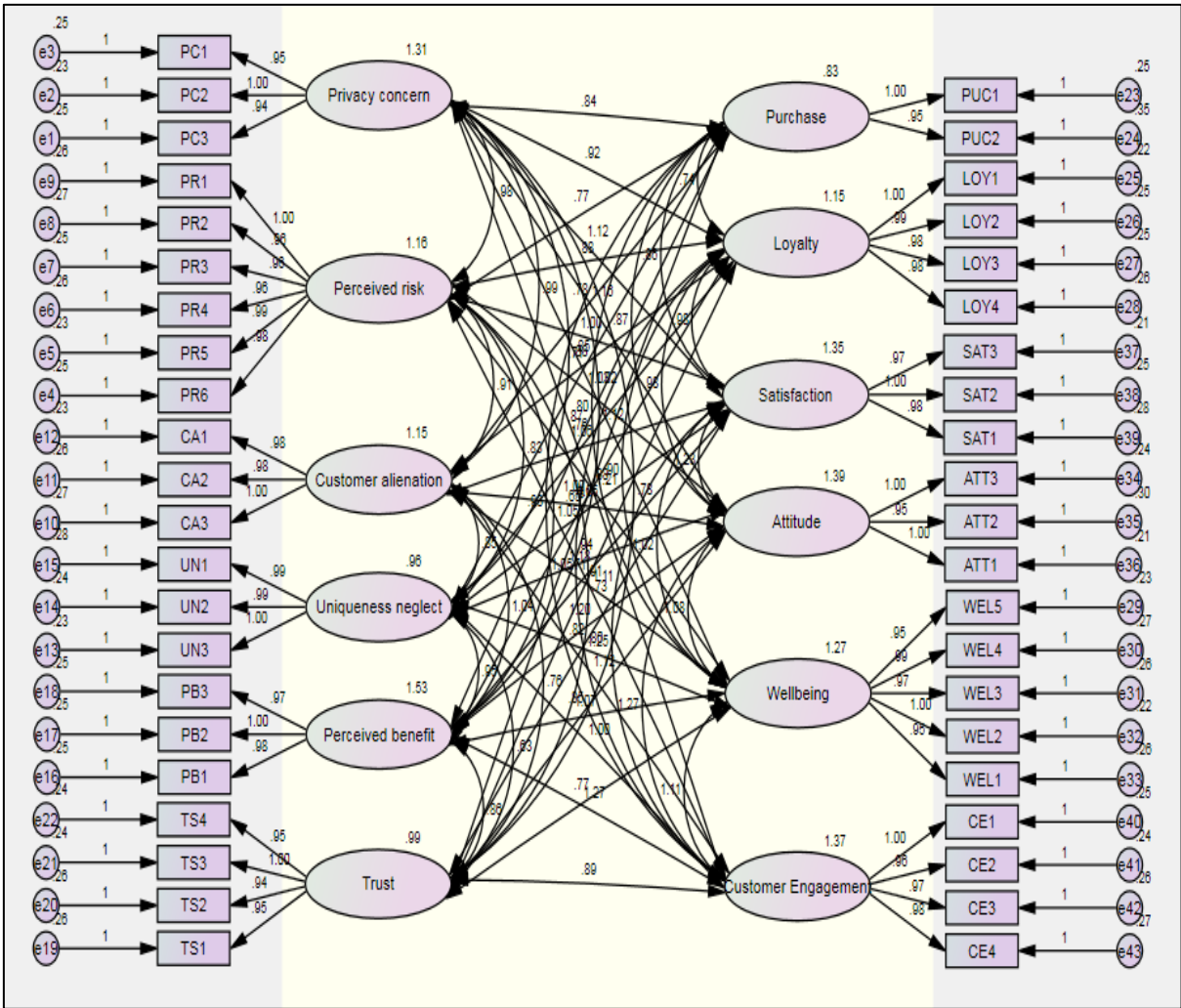
Figure 2: CFA for the Measurement Model

Table 2 offers a thorough display of the Factor Loadings (FL), indicating the strength of item loadings onto their corresponding variables. Notably, all factor loading consistently exceed or equal the crucial threshold of 0.40, affirming the robust validity of the examined constructs. Additionally, it is crucial to underscore that the associated p-values uniformly dip below the pre-established threshold of 0.05, underscoring the substantive significance of the statements concerning their connection to the respective constructs.

Table 2: Item Loading after Confirmatory Factor Analysis

			Estimate	S.E.	C.R.	P
PC3	<---	Privacy Concern	.941	.027	35.302	***
PC2	<---	Privacy Concern	1.000			
PC1	<---	Privacy Concern	.955	.027	35.345	***
PR6	<---	Perceived Risk	.976	.029	33.919	***
PR5	<---	Perceived Risk	.995	.028	35.006	***
PR4	<---	Perceived Risk	.958	.029	33.530	***
PR3	<---	Perceived Risk	.956	.028	33.854	***
PR2	<---	Perceived Risk	.961	.029	33.271	***
PR1	<---	Perceived Risk	1.000			
CA3	<---	Customer Alienation	1.000			
CA2	<---	Customer Alienation	.980	.031	32.118	***
CA1	<---	Customer Alienation	.982	.030	33.103	***
UN3	<---	Uniqueness Neglect	1.000			
UN2	<---	Uniqueness Neglect	.991	.032	30.605	***
UN1	<---	Uniqueness Neglect	.986	.033	29.504	***
PB1	<---	Perceived Benefit	.984	.026	38.590	***
PB2	<---	Perceived Benefit	1.000			
PB3	<---	Perceived Benefit	.971	.025	38.450	***
TS1	<---	Trust	.950	.031	30.542	***
TS2	<---	Trust	.937	.031	30.287	***
TS3	<---	Trust	1.000			
TS4	<---	Trust	.948	.030	31.140	***
PUC1	<---	Purchase	1.000			
PUC2	<---	Purchase	.945	.041	23.303	***
LOY1	<---	Loyalty	1.000			
LOY2	<---	Loyalty	.995	.028	34.926	***
LOY3	<---	Loyalty	.985	.028	34.588	***
LOY4	<---	Loyalty	.978	.029	34.194	***
WEL4	<---	Wellbeing	.989	.027	36.186	***
WEL3	<---	Wellbeing	.971	.027	36.115	***
WEL2	<---	Wellbeing	1.000			
WEL1	<---	Wellbeing	.955	.027	35.860	***
ATT3	<---	Attitude	1.000			
ATT2	<---	Attitude	.949	.027	34.928	***

			Estimate	S.E.	C.R.	P
ATT1	<---	Attitude	.996	.026	38.935	***
SAT3	<---	Satisfaction	.968	.026	37.812	***
SAT2	<---	Satisfaction	1.000			
SAT1	<---	Satisfaction	.982	.028	35.353	***
CE1	<---	Customer Engagement	1.000			
CE2	<---	Customer Engagement	.964	.026	37.767	***
CE3	<---	Customer Engagement	.973	.026	37.144	***
CE4	<---	Customer Engagement	.984	.027	36.843	***
WEL5	<---	Wellbeing	.951	.026	36.695	***

5.3 Descriptive Analysis

The respondent profile provides valuable insights into the demographics and characteristics of the study participants in Table 3. The gender distribution shows a higher representation of females (60.2%) compared to males (39.8%). The age distribution reveals that the largest segment falls within the 32-40 age group (40.0%), followed by the 20-31 age group (37.4%). Respondents aged 41-50 make up 12.7% of the sample, while those aged 51-60 and 61 and above account for 6.4% and 3.5%, respectively.

Table 3: Respondent Profile

Item	Frequency (Total sample = 545)	Percent (%)
Gender		
Male	217	39.8%
Female	328	60.2%
Age		
20-31	204	37.4%
32-40	218	40.0%
41-50	69	12.7%
51-60	35	6.4%
61 and above	19	3.5%

The descriptive results for the research variable offer valuable insights into the central tendencies and variations within the dataset in Table 4. Privacy Concern has a mean of 3.0606 (SD = 1.21040), reflecting moderate concerns among respondents. Perceived Risk follows closely with a mean of 3.1450 (SD = 1.14046), indicating a similar level of concern. Customer Alienation (M = 3.1009, SD = 1.15320) and Uniqueness Neglect (M = 3.1725, SD = 1.14387) suggest that participants feel moderately impacted by these aspects. Perceived Benefit (M = 3.2495, SD = 1.34086) shows that respondents recognize some advantages, while Trust (M = 2.8404, SD = 1.06681) is slightly lower, indicating variability in confidence levels.

Purchase behavior is reflected with a mean of 2.7523 (SD = 1.05157), suggesting a somewhat cautious approach. Loyalty (M = 2.9927, SD = 1.15362) and well-being (M = 2.9908, SD = 1.20885) demonstrate nearly identical mean values, showing a balanced perception of these factors. Attitude (M = 3.0165, SD = 1.28828) and Satisfaction (M = 2.8844, SD = 1.25712) suggest that respondents have mixed perspectives. Customer Engagement exhibits the highest mean at 3.4349 (SD = 1.21111), indicating strong involvement, whereas Customer Technostress has the lowest mean (M = 1.9651, SD = 1.11667), suggesting minimal stress related to technology. These findings offer a comprehensive view of the study's variables and their distribution.

Table 4: Descriptive Analysis for the Research Variables

Research Variable	Mean	Std. Deviation	Frequency 1	2	3	4	5
Privacy concern	3.0606	1.21040	76	101	136	178	54
Perceived risk	3.1450	1.14046	61	87	159	188	50
Customer alienation	3.1009	1.15320	61	102	155	175	52
Uniqueness neglect	3.1725	1.14387	61	85	147	203	49
Perceived benefit	3.2495	1.34086	90	70	97	190	98
Trust	2.8404	1.06681	71	110	236	91	37
Purchase	2.7523	1.05157	89	102	225	113	16
Loyalty	2.9927	1.15362	67	117	160	155	46
Wellbeing	2.9908	1.20885	78	107	161	140	59
Attitude	3.0165	1.28828	75	142	107	141	80

Research Variable	Mean	Std. Deviation	Frequency				
			1	2	3	4	5
Satisfaction	2.8844	1.25712	95	123	134	136	57
Customer Engagement	3.4349	1.21111	17	149	91	156	132
Customer Technostress	1.9651	1.11667	251	144	84	50	16

To verify Normality, the Kolmogorov-Smirnov test is commonly used for samples larger than 50 observations. This formal test assumes normality if the P-value exceeds 0.05. The results of the Kolmogorov-Smirnov test for the research variables revealed that the data is not normally distributed, as all P-values are below 0.05. This indicates the need for a supplementary informal assessment to gauge the data's approximate normality. The informal evaluation reveals that some values are not at the acceptable range of ±1. Consequently, opting for non-parametric tests is considered.

Regarding Multicollinearity, the VIF (Variance Inflation Factor) values for the variables in the study were all below the threshold of 5. Therefore, these results suggest that the independent variables in the study do not suffer from significant multicollinearity, ensuring the reliability of the regression analysis.

Table 5 provides a comprehensive correlation matrix, highlighting significant positive relationships between research variables. The findings demonstrate that Privacy Concern, Perceived Risk, Customer Alienation, and Uniqueness Neglect are all significantly positively related to Perceived Benefit, with P-values below 0.05 (P = 0.000) and correlation coefficients of r = 0.817, 0.818, 0.797, and 0.826, respectively. Moreover, Privacy Concern, Perceived Risk, Customer Alienation, and Uniqueness Neglect all exhibit a significant positive relationship with Trust, as indicated by P-values below 0.05 (P = 0.000). The correlation coefficients further support this strong association, with values of r = 0.711, 0.702, 0.721, and 0.713, respectively.

Additionally, Privacy Concern, Perceived Risk, Customer Alienation, and Uniqueness Neglect all show a significant positive relationship with Purchase, with P-values less than 0.05 (P = 0.000). The correlation coefficients further validate this connection, with values of r = 0.753,

0.737, 0.735, and 0.759, respectively. Moreover, Privacy Concern, Perceived Risk, Customer Alienation, and Uniqueness Neglect demonstrate a significant positive relationship with Loyalty, as indicated by P-values below 0.05 (P = 0.000). This strong association is further supported by correlation coefficients of r = 0.761, 0.778, 0.756, and 0.758, respectively.

Additionally, Privacy Concern, Perceived Risk, Customer Alienation, and Uniqueness Neglect have a significant positive relationship with Well-being, as indicated by P-values below 0.05 (P = 0.000). This relationship is further supported by correlation coefficients of r = 0.791, 0.759, 0.768, and 0.763, respectively. Furthermore, Privacy Concern, Perceived Risk, Customer Alienation, and Uniqueness Neglect are also significantly positively associated with Attitude, with P-values remaining below 0.05 (P = 0.000). This strong connection is reinforced by correlation coefficients of r = 0.861, 0.821, 0.819, and 0.835, respectively.

Moreover, Privacy Concern, Perceived Risk, Customer Alienation, and Uniqueness Neglect exhibit a significant positive relationship with Satisfaction, as evidenced by P-values below 0.05 (P = 0.000). This strong association is further supported by correlation coefficients of r = 0.824, 0.813, 0.825, and 0.818, respectively. Furthermore, Privacy Concern, Perceived Risk, Customer Alienation, Uniqueness Neglect, Perceived Benefit, Trust, Purchase, Loyalty, Wellbeing, Attitude, and Satisfaction are significantly positively associated with Customer Engagement, with P-values remaining below 0.05 (P = 0.000). This strong connection is reinforced by correlation coefficients of r = 0.900, 0.880, 0.882, 0.887, 0.908, 0.778, 0.822, 0.850, 0.855, 0.922, and 0.923, respectively.

Table 5: Correlation Matrix for the Research Variables

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Privacy Concern	R	1.000											
	Sig.	.											
	N	545											

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
2. Perceived Risk	**R**	.782**	1.000										
	Sig.	.000	.										
	N	545	545										
3. Customer Alienation	**R**	.809**	.778**	1.000									
	Sig.	.000	.000	.									
	N	545	545	545									
4. Uniqueness Neglect	**R**	.804**	.808**	.802**	1.000								
	Sig.	.000	.000	.000	.								
	N	545	545	545	545								
5. Perceived Benefit	**R**	.817**	.818**	.797**	.826**	1.000							
	Sig.	.000	.000	.000	.000	.							
	N	545	545	545	545	545							
6. Trust	**R**	.711**	.702**	.721**	.713**	.729**	1.000						
	Sig.	.000	.000	.000	.000	.000	.						
	N	545	545	545	545	545	545						
7. Purchase	**R**	.753**	.737**	.735**	.759**	.755**	.672**	1.000					
	Sig.	.000	.000	.000	.000	.000	.000	.					
	N	545	545	545	545	545	545	545					
8. Loyalty	**R**	.761**	.778**	.756**	.758**	.799**	.691**	.730**	1.000				
	Sig.	.000	.000	.000	.000	.000	.000	.000	.				

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
9. Wellbeing	N	545	545	545	545	545	545	545	545				
	R	.791**	.759**	.768**	.763**	.798**	.703**	.720**	.753**	1.000			
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.			
	N	545	545	545	545	545	545	545	545	545			
10. Attitude	R	.861**	.821**	.819**	.835**	.836**	.740**	.767**	.775**	.810**	1.000		
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.		
	N	545	545	545	545	545	545	545	545	545	545		
11. Satisfaction	R	.824**	.813**	.825**	.818**	.832**	.719**	.765**	.800**	.784**	.888**	1.000	
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.	
	N	545	545	545	545	545	545	545	545	545	545	545	
12. Customer Engagement	R	.900**	.880**	.882**	.887**	.908**	.778**	.822**	.850**	.855**	.922**	.923**	1.000
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.
	N	545	545	545	545	545	545	545	545	545	545	545	545
**. Correlation is significant at the 0.01 level (2-tailed).													

Structural Equation Modeling (SEM) analysis was utilized to evaluate the influence of the research variables, as evidenced in Table 6. The SEM results, explained below, provide valuable insights into the relationships between the variables:

- **For the first hypothesis *"There is a Significant Relationship Between the Darkside of AI and Customer Engagement with Brands"*,**
  - **It could be observed that there is a significant positive effect of Privacy concern on Customer Engagement, as the P-value is less than 0.05 and the Estimate 0.421. Furthermore, there is an insignificant effect of Perceived risk, Customer alienation, and Uniqueness neglect on Customer**

Engagement, as the P-value is more than 0.05. Therefore, the first hypothesis is partially supported.

- For the second hypothesis *"There is a Significant Relationship Between the Darkside of AI and Cognitive Responses"*, it consists of two sub hypotheses, it could be observed that:

  - For the first sub hypothesis of the second hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Perceived benefit, as the corresponding P-values are less than 0.05, and the corresponding estimates are (Estimate = 0.344, 0.266, 0.202, and 0.290).

  - For the second sub hypothesis of the second hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, and Customer alienation on Trust, as the corresponding P-values are less than 0.05, and the corresponding estimates are (Estimate = 0.181, 0.178, and 0.280), while there is an insignificant effect of Uniqueness neglect on Trust as the P-value is more than 0.05. Therefore, the second hypothesis is partially supported.

- For the third hypothesis *"There is a Significant Relationship Between the Darkside of AI and Behavioral Responses"*, it consists of three sub hypotheses, it could be observed that:

  - For the first sub hypothesis of the third hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Purchase, as the corresponding P-values are less than 0.05, and the corresponding estimates are (Estimate = 0.287, 0.179, 0.179, and 0.180).

  - For the second sub hypothesis of the third hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Loyalty, as the corresponding P-values are less than 0.05, and the corresponding estimates are (Estimate = 0.254, 0.313, 0.220, and 0.125).

  - For the third sub hypothesis of the third hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Wellbeing, as the corresponding P-values are less than 0.05, and the

corresponding estimates are (Estimate = 0.425, 0.125, 0.224, and 0.141). Therefore, the third hypothesis is fully supported.

- For the fourth hypothesis **"There is a Significant Relationship Between Darkside of AI and Affective Responses"**, it consists of two sub hypotheses, it could be observed that:

    - For the first sub hypothesis of the third hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Attitude, as the corresponding P-values are less than 0.05, and the corresponding estimates are (Estimate = 0.434, 0.190, 0.220, and 0.273).

    - For the second sub hypothesis of the third hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Satisfaction, as the corresponding P-values are less than 0.05, and the corresponding estimates are (Estimate = 0.346, 0.155, 0.349, and 0.203). Therefore, the fourth hypothesis is fully supported.

- For the fifth hypothesis **"There's a Significant Relationship Between Cognitive Responses and Customer Engagement with Brands"**,

    - It could be observed that there is a significant positive effect of Perceived benefit on Customer Engagement, as the P-value is less than 0.05 and the Estimate 0.098. Furthermore, there is an insignificant effect of Trust on Customer Engagement, as the P-value is more than 0.05. Therefore, the fifth hypothesis is partially supported.

- For the sixth hypothesis **"There is a Significant Relationship Between Behavioral Responses and Customer Engagement with Brands"**,

    - It could be observed that there is a significant positive effect of Loyalty on Customer Engagement, as the P-value is less than 0.05 and the Estimate 0.067. Furthermore, there is an insignificant effect of Purchase, Wellbeing on Customer Engagement, as the P-values are more than 0.05. Therefore, the sixth hypothesis is partially supported.

- **For the seventh hypothesis** *"There is a Significant Relationship Between Affective Responses and Customer Engagement with Brands"*,

  - **It could be observed that there is a significant positive effect of Attitude, and Satisfaction on Customer Engagement, as the P-values are less than 0.05 and the Estimates are 0.096, and 0.155. Therefore, the seventh hypothesis is fully supported.**

- **For the eighth hypothesis** *"Cognitive responses mediate the relationship between Darkside of AI and Customer Engagement"*, **it consists of two sub hypotheses:**

  - **Based on the analysis results, it could be observed that there is a significant effect of Perceived benefit on Customer Engagement, so there is a direct effect of the Perceived benefit on Customer Engagement, while there is an insignificant effect of Trust on Customer Engagement, thus, Trust could not play a mediation role.**

  - **For the first sub hypothesis of the eighth hypothesis** *"Perceived benefit mediates the relationship between Darkside of AI and Customer Engagement"*. **Based on the analysis results, it could be observed that there is a significant effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Perceived benefit. Therefore, Perceived benefit could mediate the relationship between Privacy concern, Perceived risk, Customer alienation, Uniqueness neglect, and Customer Engagement.**

    It could be noted that Perceived benefit partially mediates the relationship between Privacy concern, and Customer Engagement as the effect remains significant at the presence of Perceived benefit, while fully mediating the relationship between Perceived risk, Customer alienation, Uniqueness neglect and Customer Engagement as the effect turned out to be insignificant at the presence of Perceived benefit. Therefore, the eighth hypothesis is partially supported.

- **For the ninth hypothesis** *"Behavioral responses mediate the relationship between Darkside of AI and Customer Engagement"*, **it consists of three sub hypotheses:**

- Based on the analysis results, it could be observed that there is a significant effect of Loyalty on Customer Engagement, so, there is a direct effect of Loyalty on Customer Engagement, while there is an insignificant effect of Purchase, and Wellbeing on Customer Engagement, thus, Purchase, and Wellbeing could not play a mediation role.

- For the second sub hypothesis of the ninth hypothesis *"Loyalty mediates the relationship between Darkside of AI and Customer Engagement"*. Based on the analysis results, it could be observed that there is a significant effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Loyalty. Therefore, Loyalty could mediate the relationship between Privacy concern, Perceived risk, Customer alienation, Uniqueness neglect, and Customer Engagement.

- It could be noted that Loyalty partially mediates the relationship between Privacy concern, and Customer Engagement as the effect remains significant at the presence of Loyalty, while, fully mediates the relationship between Perceived risk, Customer alienation, Uniqueness neglect and Customer Engagement as the effect turned out to be insignificant at the presence of Loyalty. Therefore, the ninth hypothesis is partially supported.

- For the tenth hypothesis *"Affective responses mediate the relationship between Darkside of AI and Customer Engagement"*, it consists of two sub hypotheses:

- Based on the analysis results, it could be observed that there is a significant effect of Attitude, and Satisfaction on Customer Engagement, so, there is a direct effect of Attitude, and Satisfaction on Customer Engagement.

- For the first sub hypothesis of the tenth hypothesis *"Attitude mediates the relationship between Darkside of AI and Customer Engagement"*. Based on the analysis results, it could be observed that there is a significant effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Loyalty. Therefore, Attitude could mediate the relationship between Privacy concern, Perceived risk, Customer alienation, Uniqueness neglect, and Customer Engagement.

- **It could be noted that Attitude partially mediates the relationship between Privacy concern, and Customer Engagement as the effect remains significant at the presence of Attitude, while fully mediate the relationship between Perceived risk, Customer alienation, Uniqueness neglect and Customer Engagement as the effect turned out to be insignificant at the presence of Attitude.**

- **For the second sub hypothesis of the tenth hypothesis *"Satisfaction mediates the relationship between Darkside of AI and Customer Engagement".* Based on the analysis results, it could be observed that there is a significant effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Loyalty. Therefore, Satisfaction could mediate the relationship between Privacy concern, Perceived risk, Customer alienation, Uniqueness neglect, and Customer Engagement.**

- **It could be noted that Satisfaction partially mediate the relationship between Privacy concern, and Customer Engagement as the effect remains significant at the presence of Satisfaction, while, fully mediate the relationship between Perceived risk, Customer alienation, Uniqueness neglect and Customer Engagement as the effect turned to be insignificant at the presence of Satisfaction. Therefore, the tenth hypothesis is fully supported.**

- **For the eleventh hypothesis *"Customer Technostress moderates the relationship between Darkside of AI and Customer Engagement".* It could be noted that Customer Technostress moderates the relationship between Privacy concern and Customer Engagement, as the interaction between Privacy concern and Customer Technostress is significant, while Customer Technostress could not moderate the relationship between Perceived risk, Customer alienation, Uniqueness neglect, and Customer Engagement, as the interaction between Perceived risk, Customer alienation, Uniqueness neglect, and Customer Technostress is insignificant**

Table 6: SEM Analysis for the Research Variables

			Estimate	P	R²
Perceived benefit	<---	**Privacy Concern**	**.344**	***	
Perceived benefit	<---	**Perceived risk**	**.266**	***	
Perceived benefit	<---	**Customer Alienation**	**.202**	***	**.760**
Perceived benefit	<---	**Uniqueness Neglect**	**.290**	***	
Trust	<---	**Privacy Concern**	**.181**	**.001**	
Trust	<---	**Perceived Risk**	**.178**	**.001**	
Trust	<---	**Customer Alienation**	**.280**	***	**.572**
Trust	<---	**Uniqueness Neglect**	**.095**	**.116**	
Purchase	<---	**Privacy Concern**	**.287**	***	
Purchase	<---	**Perceived Risk**	**.179**	***	
Purchase	<---	**Customer Alienation**	**.179**	***	**.760**
Purchase	<---	**Uniqueness Neglect**	**.180**	**.001**	
Loyalty	<---	**Privacy Concern**	**.254**	***	
Loyalty	<---	**Perceived Risk**	**.313**	***	
Loyalty	<---	**Customer Alienation**	**.220**	***	**.648**
Loyalty	<---	**Uniqueness Neglect**	**.125**	**.036**	
Wellbeing	<---	**Privacy Concern**	**.425**	***	
Wellbeing	<---	**Perceived Risk**	**.125**	**.018**	
Wellbeing	<---	**Customer Alienation**	**.224**	***	**.702**
Wellbeing	<---	**Uniqueness Neglect**	**.141**	**.015**	
Attitude	<---	**Privacy Concern**	**.434**	***	
Attitude	<---	**Perceived Risk**	**.190**	***	
Attitude	<---	**Customer Alienation**	**.220**	***	**.841**
Attitude	<---	**Uniqueness Neglect**	**.273**	***	
Satisfaction	<---	**Privacy Concern**	**.346**	***	**.826**

			Estimate	P	R²
Satisfaction	<---	Perceived Risk	.155	***	
Satisfaction	<---	Customer Alienation	.349	***	
Satisfaction	<---	Uniqueness Neglect	.203	***	
Customer Engagement	<---	Privacy Concern	.421	***	
Customer Engagement	<---	Perceived Risk	.114	.085	
Customer Engagement	<---	Customer Alienation	.058	.623	
Customer Engagement	<---	Uniqueness Neglect	.032	.826	
Customer Engagement	<---	Perceived Benefit	.098	***	
Customer Engagement	<---	Trust	.033	.214	
Customer Engagement	<---	Purchase	.063	.169	
Customer Engagement	<---	Loyalty	.067	.016	.967
Customer Engagement	<---	Wellbeing	.046	.105	
Customer Engagement	<---	Attitude	.096	.016	
Customer Engagement	<---	Satisfaction	.155	***	
Customer Engagement	<---	PC_CT	-.096	.015	
Customer Engagement	<---	PR_CT	.019	.380	
Customer Engagement	<---	CA_CT	.029	.431	
Customer Engagement	<---	UN_CT	.042	.341	

The model fit indices, including CMIN/DF (1.251), GFI (0.910), CFI (0.993), AGFI (0.895), and RMSEA (0.021), all fall within acceptable

ranges. Figure 3 visually represents the SEM model that was employed to analyze the impact of the research model.
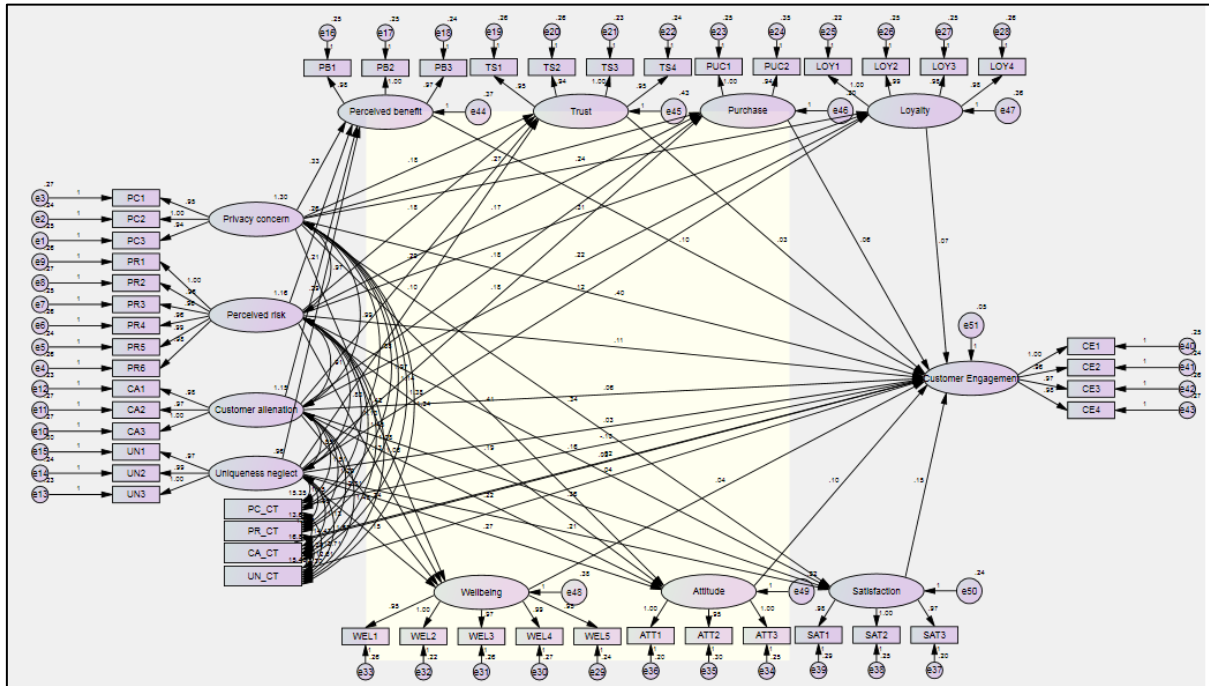
Figure 3: SEM for the Research Variables

6. Research Discussion and Conclusion

6.1 Research Discussion

The empirical analysis offered a set of conclusions that are as follows:
Regarding H1: It could be observed that there is a significant positive effect of Privacy concern on Customer Engagement. Furthermore, there is an insignificant effect of Perceived risk, Customer alienation, and Uniqueness neglect on Customer Engagement. Therefore, the first hypothesis is partially supported.

Regarding H2: For the first sub-hypothesis, a significant positive effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Perceived benefit was found. For the second sub-hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, and Customer alienation on Trust, while there is an insignificant effect of Uniqueness neglect on Trust. Therefore, the second hypothesis is partially supported.

Regarding H3: For the first sub-hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Purchase. For the second sub-hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Loyalty. For the third sub-hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Wellbeing. Therefore, the third hypothesis is fully supported.

Regarding H4: For the first sub hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Attitude. For the second sub hypothesis, there is a significant positive effect of Privacy concern, Perceived risk, Customer alienation, and Uniqueness neglect on Satisfaction. Therefore, the fourth hypothesis is fully supported.

Regarding H5: It could be observed that there is a significant positive effect of the Perceived benefit on Customer Engagement. Furthermore, there is an insignificant effect of Trust on Customer Engagement. Therefore, the fifth hypothesis is partially supported.

Regarding H6: It could be observed that there is a significant positive effect of Loyalty on Customer Engagement. Furthermore, there is an insignificant effect of Purchase, Wellbeing on Customer Engagement. Therefore, the sixth hypothesis is partially supported.

Regarding H7: It could be observed that there is a significant positive effect of Attitude, and Satisfaction on Customer Engagement. Therefore, the seventh hypothesis is fully supported.

Regarding H8: It could be observed that there is a significant effect of Perceived benefit on Customer Engagement, so, there is a direct effect of the Perceived benefit on Customer Engagement, while there is an insignificant effect of Trust on Customer Engagement, thus, Trust could not play a mediation role. Therefore, the eighth hypothesis is partially supported.

Regarding H9: It could be observed that there is a significant effect of Loyalty on Customer Engagement, so, there is a direct effect of Loyalty on Customer Engagement, while there is an insignificant effect of Purchase, and Wellbeing on Customer Engagement, thus, Purchase, and Wellbeing could not play a mediation role. Therefore, the ninth hypothesis is partially supported.

Regarding H10: Based on the analysis results, it could be observed that there is a significant effect of Attitude, and Satisfaction on Customer Engagement, so, there is a direct effect of the Attitude, and Satisfaction on Customer Engagement. Therefore, the tenth hypothesis is fully supported.

Regarding H11: It could be noted that Customer Technostress moderate the relationship between Privacy concern and Customer Engagement, as the interaction between Privacy concern and Customer Technostress is significant, while, Customer Technostress could not moderate the relationship between Perceived risk, Customer alienation, Uniqueness neglect, and Customer Engagement, as the interaction between Perceived risk, Customer alienation, Uniqueness neglect, and Customer Technostress is insignificant.

6.2 Conclusion

The results of the current analysis came consistent with the studies of (Barari *et al.*, 2024; Siu *et al.,* 2023; *Sun et al.*, 2022), as the current study concluded that AI-driven privacy issues, affective reactions, and cognitive evaluations offers a significant link in shaping customer engagement, capturing the process by which technological apprehensions and benefits condition consumer relationships with brands. Privacy concerns and emotional responses were the prevailing engagement motivators, reflecting previous studies into AI's dual ability to empower and unsettle people.

However, the current analysis' results have contradictions with previous literature. In contrast to previous studies (Castillo *et al.*, 2020; Cheung *et al.,* 2021), trust, purchase intentions, and wellbeing were not typically linked to higher participation, and the implication is that their impact might be context-dependent or moderated by other factors such as technostress or the distinctive character of AI interactions in banking services. Moreover, the moderating impact of customer technostress was significant only for privacy concerns but not for other dark-side elements.

Accordingly, while our study confirms the significant influence of AI's dark side on cognitive, affective, and behavioral engagement processes, it also demonstrates that not all paths are similarly operated across contexts. This calls for future studies to explore further such fine-grained relationships so that organizations can take full advantage of

AI's benefits while minimizing its unexpected consequences for customer experience and loyalty.

7. Research Implications

7.1 Research Implications

The intricate interrelations between challenges of AI and customer engagement in the financial sector are explored in this study academically. The focus of the research is the moderating influence of technology-induced stress among customers but highlights the powerful impact of cognitive, behavioral, and emotional reactions on shaping the level of customer involvement. Therefore, the current study presents a set of implications by addressing the following sections:

7.2 Academic Implications

By providing an accurate representation of how AI-induced anxieties, such as privacy, perceived risk, customer isolation, and uniqueness disregard, affect customer interaction, this study contributes meaningfully to the expanding body of literature on the "dark side" of AI. It integrates the emotional, behavioral, and cognitive response role as mediators into current consumer engagement theories (Puntoni *et al.,* 2021). Additionally, the research contributes to the argument of consumer technostress as a mediator between customer engagement and AI-related issues.

The current research expanded the context of the dark side of AI's use to outside the usual technological settings. The current investigation increases the scope of research on AI in customer interactions by stressing the unique dynamics of the financial services industry in Egypt and the Arab world, whereas earlier investigations mostly centered on usual technology or non-financial industries. To investigate how AI affects consumer involvement, the current study utilized a positivism perspective, specifically in using quantitative methods like SEM.

7.3 Practical Implications

Businesses such as the banking industry, which is increasingly contingent upon AI-based services that include chat-bots, automatic

credit approvals, and AI-based investment suggestions, can benefit significantly from the implications of this current research due to its pragmatic utility. The current investigation's outcomes stressed on how imperative it is to address issues regarding AI, especially privacy concerns and perceived threats, as they have an enormous contribution to play in customer participation.

According to the outcomes of the empirical analysis stated in the current investigation, banks should be aware of the potential stress customers may feel during AI-powered interactions and actively work to reduce such negative impacts through user-friendly design, customer education, and proactive customer service support (Song *et al.*, 2022). Intended for financial services regulators and legislators working in the sector, this investigation has significant policy relevance. Policymakers need to urge financial institutions to provide clear communication and clear data protection instructions on the use of AI technology, considering the significant effect that privacy concerns, perceived risk, and technostress offer for client engagement.

8. Research Recommendations and Limitations

8.1 Research Recommendations

Based on the findings of this study, several recommendations can be made for both future researchers and practitioners interested in AI usage in boosting customer engagement. Future investigations are recommended to investigate consumer involvement in other industries, such as retail, healthcare, or entertainment, when issues pertaining to AI influence their involvement, but this study looked at the Egyptian financial services sector (Esmaeilzadeh, 2020). Future research may examine the long-term impact of AI on consumer engagement through longitudinal studies. Cross-country and cross-cultural studies can reveal whether cultural values, technological infrastructure, or economic development shape AI-related concerns and responses to AI-based engagement.

Regarding practitioners, banks ought to have strong data protection policies in place and ensure data usage transparency. Customers should be assured that their data is secure, as this can eliminate privacy issues and improve AI-based service trust. Financial institutions should design AI interfaces that not only perform well but

also provide emotional support and are convenient to use. Financial entities need to start communicating the advantages of AI since consumer behavior is strongly affected by perceived danger and customer engagement. Banks should embrace easy-to-use AI systems as well as adequate customer care in a bid to minimize possible technostress from advanced AI interfaces.

8.2 Research Limitations

This current investigation offered vital empirical views regarding the influence of AI on customer engagement in the Egyptian banking sector. However, its cross-sectional approach means that it cannot be applied to other sectors or nations; therefore, future studies are recommended to use other approaches to include other sectors and counties. The study also did not account for technological characteristics like AI sophistication and customization, which might influence engagement. Furthermore, while technostress reduced privacy concerns, its impact was modest, highlighting the need for more accurate assessments in future investigations. These constraints necessitate additional exploration into the complicated interplay between AI, consumer behavior, and engagement.

9. References

Al-Debei, M., Akroush, M.and Ashouri, M., (2015). Consumer attitudes towards online shopping: *The effects of trust, perceived benefits, and perceived web quality. Internet Research*, *25*(5), 707-733. Retrieved From https://www.researchgate.net/publication/350383204_Consumer_attitudes_towards_online_shopping_The_effects_of_trust_perceived_benefits_and_perceived_web_quality

Ameen, N., Hosany, S., and Paul, J., (2022). The personalisation-privacy paradox: Consumer interaction with smart technologies and shopping mall loyalty. Computers in Human Behavior, 126(1), 106976. Retrieved From https://pure.royalholloway.ac.uk/en/publications/the-personalisation-privacy-paradox-consumer-interaction-with-sma

Barari, M. (2024). How and when does gamification level up mobile app effectiveness? Meta-analytics review. Marketing Intelligence & Planning, 42(4), 1-32. Retrieved From https://www.researchgate.net/publication/381789135_How_and_when_does_gamification_level_up_mobile_app_effectiveness_Meta-analytics_review

Barari, M., Casper Ferm, L.E., Quach, S., Thaichon, P., and Ngo, L., (2024.) The dark side of artificial intelligence in marketing: meta-analytics review. *Marketing Intelligence & Planning*, *42*(4), 1-10. Retrieved From https://www.researchgate.net/publication/381223930_The_dark_side_of_artificial_intelligence_in_marketing_meta-analytics_review

Bigné, E., Ruiz-Mafé, C., Badeness-Rocha, A. (2023). The influence of negative emotions on brand trust and intention to share cause-related posts: A neuroscientific study. *Journal of Business Research*, 157(1), 1113628. 1-10. Retrieved From https://roderic.uv.es/rest/api/core/bitstreams/e2854d50-77f7-41a6-bc54-029469c52384/content

Buchanan, T., Paine, C., Joinson, A., and Reips, U., (2007). Development of measures of online privacy concern and protection for use on the Internet. *Journal of the American society for information science and technology*, *58*(2), 157-165. Retrieved From https://onlinelibrary.wiley.com/doi/abs/10.1002/asi.20459

Castillo, D., Canhoto, A., and Said, E., (2021). The dark side of AI-powered service interactions: exploring the process of co-destruction from the customer perspective. *The Service Industries Journal,* *41*(13-14), 900-925. Retrieved From

https://www.researchgate.net/publication/342574519_The_dark_side_of_AI-powered_service_interactions_exploring_the_process_of_co-destruction_from_the_customer_perspective

Castillo-Martínez, I., Flores-Bueno, D., Gómez-Puente, S., and Vite-León, V. (2024). AI in higher education: a systematic literature review. *Frontiers In Education,1-7*. Retrieved From https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2024.1391485/full

Chang, P. zhang, W., Cai, Q., and Guo, H. (2024). Does ai-driven technostress promote or hinder employees' artificial intelligence adoption intention? A moderated mediation model of affective reactions and technical self-efficacy. *Psychology Research and Behaviour Management*, *17*(1), 413-427. Retrieved From https://www.researchgate.net/publication/378129664_Does_AI-Driven_Technostress_Promote_or_Hinder_Employees'_Artificial_Intelligence_Adoption_Intention_A_Moderated_Mediation_Model_of_Affective_Reactions_and_Technical_Self-Efficacy

Chen, S., Tran, K., Xia, Z., Waseem, D., Zhang, J. and Potdar, B., (2023). The double-edged effects of data privacy practices on customer responses. *International Journal of Information Management*, *69*(1), 102600. Retrieved From https://www.researchgate.net/publication/365670992_The_doubleedged_effects_of_data_privacy_practices_on_customer_responses

Cheng, X., Lin, X., Shen, X., Zarifis, A., and Mou, J., (2022). The dark sides of AI. *Electronic Markets*, *32*(1), 11-15. Retrieved From https://link.springer.com/article/10.1007/s12525-022-00531-5

Cheng, Y., and Jiang, H., (2020). How do AI-driven chatbots impact user experience? Examining gratifications, perceived privacy risk, satisfaction, loyalty, and continued use. *Journal of Broadcasting & Electronic Media*, *64*(4), 592-614. Retrieved From https://www.researchgate.net/publication/347025664_How_Do_AIdriven_Chatbots_Impact_User_Experience_Examining_Gratifications_Perceived_Privacy_Risk_Satisfaction_Loyalty_and_Continued_Use

Cheung, M., Pires, G., Rosenberger, P., Leung, W., and Sharipudin, M., (2021). The role of consumer-consumer interaction and consumer-brand interaction in driving consumer-brand engagement and behavioral intentions. *Journal of retailing and consumer services*, *61(1)*, 102574. Retrieved From https://ideas.repec.org/a/eee/joreco/v61y2021ics0969698921001405.html

Chi, O, Jia, S., Li, Y., and Gursoy, D., (2021). Developing a formative

scale to measure consumers' trust toward interaction with artificially intelligent (AI) social robots in service delivery. *Computers in Human Behavior*, *118*(1), 106700. Retrieved From https://www.researchgate.net/publication/348567525_Developing_a_formative_scale_to_measure_consumers'_trust_toward_interaction_with_artificially_intelligent_AI_social_robots_in_service_delivery

Dai, Y., and Wang, T., (2021). Prediction of customer engagement behaviour response to marketing posts based on machine learning. *Connection Science*, *33*(4), 891-910. Retrieved From https://www.tandfonline.com/doi/full/10.1080/09540091.2021.1912710

Dantsoho, M., Ringim, K., Kura, K. (2021). The Relationship between Artificial Intelligence (AI) Quality, Customer Preference, Satisfaction and Continuous Usage Intention of e-Banking Services. *Indonesian Business Review, 4*(1), 24-43. Retrieved From https://www.researchgate.net/publication/353230750_The_Relationship_between_Artificial_Intelligence_AI_Quality_Customer_Preference_Satisfaction_and_Continuous_Usage_Intention_of_e-Banking_Services

Esmaeilzadeh, P., (2020). Use of AI-based tools for healthcare purposes: a survey study from consumers' perspectives. *BMC Medical Informatics and Decision Making*, *20(1)*, 1-19. Retrieved From https://bmcmedinformdecismak.biomedcentral.com/articles/10.1186/s12911-020-01191-1

Farbod, S., (2024). *Exploring the Dark Side of AI-enabled Services: Impacts on Customer Experience and Well-being* (Master's thesis, University of Twente). Retrieved From http://essay.utwente.nl/98773/

Ferm, L., Quach, S. and Thaichon, P., (2023). Data privacy and artificial intelligence (AI): how AI collects data and its impact on data privacy. In *Artificial Intelligence for Marketing Management,* 163-174. Routledge. Retrieved From https://research-repository.uwa.edu.au/en/publications/data-privacy-and-artificial-intelligence-ai-how-ai-collects-data-

Fickers, A., (2023). *The dark side of customer engagement in AI-driven interactions: The case of chatbots in the tourism industry*. (Master dissertation specialising in International strategic marketing), HEC LieGe, Management school, 1-115. Retrieved From https://matheo.uliege.be/bitstream/2268.2/17642/4/Thesis_s173205_FICKERS_2023.pdf

Ford, B., Lam., P., John, O., and Mauss, R., (2017). The Psychological Health Benefits of Accepting Negative Emotions and Thoughts:

Laboratory, Diary, and Longitudinal Evidence. *Journal of Personal Social Psychology, 115*(6), 1075–1092. https://pmc.ncbi.nlm.nih.gov/articles/PMC5767148/

Frater, M., and Mushininga, R. (2025). The disruptive nature of AI-Powered Technologies:Balancing the dichotomy of dependence and autonomy for IT Professionals. International Journal of Research in Business and Social Science, 2147-4478, 14(2), 58-69. Retrieved From https://www.researchgate.net/publication/389666828_The_disruptive_nature_of_AIPowered_technologies_balancing_the_dichotomy_of_dependence_and_autonomy_for_IT_Professionals

Gao, L., Li, G., Tsai, F., Gao, C., Zhu, M. and Qu, X., (2023). The impact of artificial intelligence stimuli on customer engagement and value co-creation: the moderating role of customer ability readiness. Journal of Research in Interactive Marketing, 17(2), 317-333. Retrieved From https://www.emerald.com/insight/content/doi/10.1108/jrim-10-2021-0260/full/html

García-Contreras, R., Muñoz-Chávez, J., Muñoz-Chávez, R., Lezama-León, E. and Barrios-Quiroz, H., (2022). Work alienation, deviant workplace behavior and performance in public sector. Sustainability, 14(17), 10490. ecialising in International strategic marketing), HEC LieGe, Management school, 1-115. Retrieved From https://www.mdpi.com/2071-1050/14/17/10490

Grewal, D., Guha, A., Satornino, C.B. and Schweiger, E.B., (2021). Artificial intelligence: The light and the darkness. Journal of Business Research, 136(1), 229-236. ecialising in International strategic marketing), HEC LieGe, Management school, 1-115. Retrieved From https://ideas.repec.org/a/eee/jbrese/v136y2021icp229-236.html

Gokarna, P., (2021). Study of Customer Engagement through Emotional Branding. Shanlax International Journal of Management, 8(3), 11-20. Retrieved From https://www.researchgate.net/publication/348165064_Study_of_Customer_Engagement_through_Emotional_Branding

Hajiheydari, N., Delgosha, M.S. and Saheb, T., (2025). Patients' Cognitive Responses to AI Diagnosis: A Contextualised Mixed-Methods Study of Inhibitors and Motivators. Social Science & Medicine, 371(2), 117850. Retrieved From https://www.researchgate.net/publication/389191978_Patients'_Cognitive_

Responses_to_AI_Diagnosis_A_Contextualised_Mixed_Methods_Study_of_Inhibitors_and_Motivators

Han, S., and Yang, H., (2018). Understanding adoption of intelligent personal assistants: A parasocial relationship perspective. Industrial Management & Data Systems, 118(3), 618-636. Retrieved From https://www.researchgate.net/publication/323299979_Understanding_adoption_of_intelligent_personal_assistants_A_parasocial_relationship_perspective

Ho, R. (2021). Chatbot for Online Customer Service: Customer Engagement in the Era of Artificial Intelligence. Impact of Globalization and Advanced Technologies on Online Business Models. 16-31. Retrieved From https://www.researchgate.net/publication/349172735_Chatbot_for_Online_Customer_Service_Customer_Engagement_in_the_Era_of_Artificial_Intelligence

Jain, V., Wadhwani, K., and Eastman, J., (2023). Artificial intelligence consumer behavior: A hybrid review and research agenda. Journal of Consumer Behaviour, 23(3), 1-18. Retrieved From https://www.researchgate.net/publication/373350662_Artificial_intelligence_consumer_behavior_A_hybrid_review_and_research_agenda

Kallel, A., Ben Dahmane-Mouelhi, N., Chaouali, W., and Danks, N., (2024). Hey chatbot, why do you treat me like other people? The role of uniqueness neglect in human-chatbot interactions. Journal of Strategic Marketing, 32(2), 170-186. Retrieved From https://scispace.com/papers/hey-chatbot-why-do-you-treat-me-like-other-people-the-role-1r6ufddb#:~:text=The%20role%20of%20uniqueness%20neglect%20in%20human%2Dchatbot%20interactions,-Aicha%20Kallel%2C&text=TL%3BDR%3A%20In%20this%20article,chatbot%20competence%20on%20customer%20satisfaction.

Katsifaraki, G., and Theodosiou, M., (2024). The role of service-dominant logic strategic orientations in driving customer engagement in online retailing. Journal of Interactive Marketing, 59(1), 99-115. Retrieved From https://journals.sagepub.com/doi/abs/10.1177/10949968231180497

Kim, M., Lee, C. and Jung, T., (2020). Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model. Journal of Travel Research, 59(1), 69-89. Retrieved From https://www.researchgate.net/publication/329126976_Exploring_Consumer_Behavior_in_Virtual_Reality_Tourism_Using_an_Extended_Stimulus-Organism-Response_Model

Kleinberg, J., Ludwig, J., Mullainathany, S., and Sunsteinz, C. (2018). Discrimination in the age of algorithms. Journal of Legal Analysis, 10(1), 113-174. Retrieved From

https://academic.oup.com/jla/article/doi/10.1093/jla/laz001/5476086

Knoll, J. and Matthes, J., 2017. The effectiveness of celebrity endorsements: a meta-analysis. Journal of the Academy of Marketing Science, 45(1), 55-75. Retrieved From https://link.springer.com/article/10.1007/s11747-016-0503-8

Khac, D., Do., D., Rahman., K., and Robinson, L., (2020). Determinants of negative customer engagement behaviours. Journal of Services Marketing 34(2), 117-135. Retrieved From https://www.researchgate.net/publication/341869293_Determinants_of_negative_customer_engagement_behaviours

Kučinskas, G (2024). Negative Effects of Revealing AI Involvement in Products: Mediation by Authenticity and Risk, Moderation by Trust in AI and Familiarity with AI. Retrieved From https://www.researchgate.net/publication/380034890_Negative_Effects_of_Revealing_AI_Involvement_in_Products_Mediation_by_Authenticity_and_Risk_Moderation_by_Trust_in_AI_and_Familiarity_with_AI

Lahlou, S. (2025). Mitigating Societal Cognitive Overload in the Age of AI: Challenges and Directions. Retrieved From https://arxiv.org/html/2504.19990v1

Lenca, M., (2023). On Artifcial Intelligence and Manipulation. Springer, 42(1), 833–842. https://link.springer.com/article/10.1007/s11245-023-09940-3

Lim, W. (2025). What Is Qualitative Research? An Overview and Guidelines. Australasian Marketing Journal, 33(2) 199–229. Retrieved From https://journals.sagepub.com/doi/pdf/10.1177/14413582241264619

Liu-Thompkins, Y., Okazaki, S., and Li, H., (2022). Artificial empathy in marketing interactions: Bridging the human-AI gap in affective and social customer experience. Journal of the Academy of Marketing Science, 50(6), 1198-1218. Retrieved From https://link.springer.com/article/10.1007/s11747-022-00892-5

Ma, L., Ou, W., and Lee, C., (2022). Investigating consumers' cognitive, emotional, and behavioral engagement in social media brand pages: A natural language processing approach. Electronic Commerce Research and Applications, 54(1),101179. Retrieved From

https://www.researchgate.net/publication/362190897_Investigating_Consumers'_Cognitive_Emotional_and_Behavioral_Engagement_in_Social_Media_Brand_Pages_a_Natural_Language_Processing_Approach

Mennella, C., Maniscalco, U., Pietro, G., and Esposito, M., (2024). Ethical and regulatory challenges of AI technologies in healthcare: A narrative review. Elsevier in Heliyon, 10(4):e26297. https://www.scilit.com/publications/bab0af0164a468d7731b5a0b9acdcca5

Mikalef, P., Conboy, K., Lundström, J., and Popovič, A., (2022). Thinking responsibly about responsible AI and 'the dark side'of AI. European Journal of Information Systems, 31(3), 257-268. Retrieved From https://www.tandfonline.com/doi/full/10.1080/0960085X.2022.2026621

Mou, Y., Xu, T. and Hu, Y., (2023). Uniqueness neglect on consumer resistance to AI. Marketing Intelligence & Planning, 41(6), 669-689. Retrieved From https://www.emerald.com/insight/content/doi/10.1108/mip-11-2022-0505/full/html

Muslik, S., Wibawa, B., and Windharto, A., (2025). The Darkside of Artificial Intelligence to Consumer Behavior: Bibliometric Review. Journal of Accounting and Finance Management, 5(6), 1579-1591. Retrieved From https://dinastires.org/JAFM/article/view/1286

Nguyen, L., Dang, T., and Duc, D., (2024). The Dark Sides of AI Advertising: The Integration of Cognitive Appraisal Theory and Information Quality Theory. Social Science Computer Review, 43(2), 397–424. Retrieved From https://journals.sagepub.com/doi/abs/10.1177/08944393241258760?ai=1gvoi&mi=3ricys&af=R

Nizamani, M., Ramzan, F., Fatima. M., and Asif., M., (2024). Investigating How Frequent Interactions with AI Technologies Impact Cognitive and Emotional Processes. Bulletin of Business and Economics (BBE), 13(3), 1-12. Retrieved From https://www.researchgate.net/publication/384458671_Investigating_How_Frequent_Interactions_with_AI_Technologies_Impact_Cognitive_and_Emotional_Processes

Park, Y., Konge, L. and Artino J., (2020). The positivism paradigm of research. Academic Medicine, 95(5), 690-694. Retrieved From https://pubmed.ncbi.nlm.nih.gov/31789841/

Pitardi, V., and Marriott, H., (2021). Alexa, she's not human but… Unveiling the drivers of consumers' trust in voice based artificial intelligence. Psychology & Marketing, 38(4), .626-642. Retrieved From https://www.researchgate.net/publication/348631314_Alexa_she's_not_human_but_Unveiling_the_drivers_of_consumers'_trust_in_voice-based_artificial_intelligence

Prentice, C., Weaven, S., and Wong, I., (2020). Linking AI quality performance and customer engagement: The moderating effect of AI preference. International Journal of Hospitality Management, 90(1), 102629. Retrieved From https://www.researchgate.net/publication/343038227_Linking_AI_quality_performance_and_customer_engagement_The_moderating_effect_of_AI_preference

Puntoni, S., Reczek, R., Giesler, M., and Botti, S., (2021). Consumers and artificial intelligence: An experiential perspective. Journal of Marketing, 85(1), 131-151. Retrieved From https://mii.ie/wp-content/uploads/2020/05/Consumers-and-Artificial-Intelligence.pdf

Quach, S., Thaichon, P., Martin, K., Weaven, S., and Palmatier, R. (2022). Digital technologies: tensions in privacy and data. Journal of the Academy of Marketing Science, 50(6), 1299–1323. https://link.springer.com/article/10.1007/s11747-022-00845-y

Seo, K., and Lee, J., (2021). The emergence of service robots at restaurants: Integrating trust, perceived risk, and satisfaction. Sustainability, 13(8), 4431. Retrieved From https://www.researchgate.net/publication/350897412_The_Emergence_of_Service_Robots_at_Restaurants_Integrating_Trust_Perceived_Risk_and_Satisfaction

Sheng, J., (2019). Being active in online communications: Firm responsiveness and customer engagement behaviour. Journal of Interactive Marketing, 46(1), 40-51. Retrieved From https://www.researchgate.net/publication/332789140_Being_Active_in_Online_Communications_Firm_Responsiveness_and_Customer_Engagement_Behaviour

Singh, P., and Singh, V. (2024). The power of AI: enhancing customer loyalty through satisfaction and efficiency. Cogent Business & Management, 11(1), 1-10 Retrieved From.https://www.researchgate.net/publication/379291965_The_power_of_AI_enhancing_customer_loyalty_through_satisfaction_and_efficiency

Siu, N., Zhang, T., and Yeung, R., (2023). The bright and dark sides of online customer engagement on brand love. Journal of Consumer Marketing, 40(7), 957-970. Retrieved From https://www.emerald.com/insight/content/doi/10.1108/jcm-01-2022-5118/full/html

Song, M., Xing, X., Duan, Y., Cohen, J. and Mou, J., (2022). Will artificial intelligence replace human customer service? The impact of communication quality and privacy risks on adoption intention. Journal of Retailing and Consumer Services, 66(1), 102900. Retrieved From https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2024.1391485/full

Sun, Y., Li, S., and Yu, L., (2022). The dark sides of AI personal assistant: effects of service failure on user continuance intention. Electronic Markets, 32(1),17-39. Retrieved From https://ideas.repec.org/a/spr/elmark/v32y2022i1d10.1007_s12525-021-00483-2.html

Suraña-Sánchez, C., and Aramendia-Muneta, M., (2024). Impact of artificial intelligence on customer engagement and advertising engagement: A review and future research agenda. International Journal of Consumer Studies, 48(2), 1-10. Retrieved From https://www.researchgate.net/publication/378552651_Impact_of_artificial_intelligence_on_customer_engagement_and_advertising_engagement_A_review_and_future_research_agenda

Tuti, M., and Sulistia, V., (2022). The customer engagement effect on customer satisfaction and brand trust and its impact on brand loyalty. Journal Management Bisnis, 13(1), 1-15. Retrieved From https://www.researchgate.net/publication/358969398_The_Customer_Engagement_Effect_on_Customer_Satisfaction_and_Brand_Trust_and_Its_Impact_on_Brand_Loyalty

Ulrich-Diener, F., and Spacek, M., (2021). Digital Transformation in Banking: A Managerial Perspective on Barriers to Change. Sustainability, 13(4): 20-23. Retrieved https://www.researchgate.net/publication/349301160_Digital_Transformation_in_Banking_A_Managerial_Perspective_on_Barriers_to_Change

Uysal, E., Alavi, S,. and Bezençon, V., (2022). Trojan horse or useful helper? A relationship perspective on artificial intelligence assistants with humanlike features. Journal of the Academy of Marketing Science, 50(6), 1153-1175. Retrieved From https://link.springer.com/article/10.1007/s11747-022-00856-9

Wang, X., Zhang, Z. and Jiang, Z. (2024). The effectiveness of human vs. AI voice-over in short video advertisements: A cognitive load theory perspective. Journal of Retailing and Consumer Services 81(S2), 104005. Retrieved From https://www.researchgate.net/publication/385453756_The_effectiveness_of_human_vs_AI_voiceover_in_short_video_advertisements_A_cognitive_load_theory_perspective

Yan, D., Wang, C., Sun, T., and Wen, D., (2024). The impact of service experience on sustainable customer engagement: The mediation of green perceived value and customer satisfaction. Corporate Social Responsibility and Environmental Management, 31(3), 2175-2194. Retrieved From https://onlinelibrary.wiley.com/doi/abs/10.1002/csr.2685

Yeo, S., Tan, C., Kumar, A., Tan, K., and Wong, J., (2022). Investigating the impact of AI-powered technologies on Instagrammers' purchase decisions in digitalization era–A study of the fashion and apparel industry. Technological Forecasting and Social Change, 177(1), 121551. Retrieved From https://www.scirp.org/reference/referencespapers?referenceid=3733991