



Chapter 17

Real-Time Consumer Engagement: Secure Data in E-Commerce via Brain-Computer Interfaces

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ABSTRACT

Within the context of e-commerce environments, the objective of this inquiry is to investigate the functioning of Brain-Computer Interfaces (BCIs) to enhance real-time client involvement. When customers interact with computer interfaces, the objective of this study is to record and analyze the neurological signals that are connected with the emotional and cognitive activity that result from those interactions. The integration of brain-computer interfaces (BCIs) into online shopping platforms will be how this objective will be achieved. By monitoring these signals in real-time, it is possible to get a more comprehensive comprehension of the preferences of stoners, the situations under which they pay attention, and the emotional responses they

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have to vivid e-commerce stimulants like product photos and announcements. For the objective of this experiment, brain-computer interface (BCI) technology that is based on electroencephalography (EEG) is being used to collect and analyze data while simulated shopping movements are present.

INTRODUCTION

As the landscape of e-commerce continues to rapidly evolve, businesses are constantly looking for new and innovative methods to improve customer interaction and optimize (Pandey, D., & Pandey, B. K., 2022) the buying experience for customers conducted online (Reddy, S., & Zhang, R., 2021). Stoner commerce has been improved by traditional methods such as targeted announcements and individualized recommendations (Smith, R., & Harrison, K., 2022); yet, these styles frequently lack the depth that is required to fully comprehend and respond to the emotional (YItayew, M. et al., 2020) and cognitive states of consumers (Jiang, Y. et al., 2023) in the present moment. Recent breakthroughs in Brain-Computer Interface(BCI) technology give a transformative opportunity to bridge this gap by providing direct perceptivity into the neurological reactions (Pandey, B. K. et al., 2024a) connected with consumer gesture

A direct wireless communication (Devasenapathy, D. et al., 2023) link between the brain and external bias can be established by the use of brain-computer interfaces (BCIs), which employ technologies (Pandey, D. et al., 2024a) that are analogous to electroencephalography (EEG) to measure and interpret cerebral effort. Through the monitoring of brain signals in real-time (Maheshwari, R.U. et al., 2024b), it is possible to have access to previously unknown information (Kennedy, G. W. et al., 2024.) regarding the emotional and cognitive responses (Tareke, S. A. et al., 2022) of customers when they interact with e-commerce platforms. The analysis of these signals (Reddy, B. R. S. et al., 2023) enables businesses to acquire a more in-depth comprehension of the preferences, attention focus, and emotional engagement (Pandey, D. et al., 2020) of stoners, which ultimately results in online buying gestures that are more accustomed to themselves and more responsive.

The incorporation of BCIs into the environment of e-commerce has the potential to rethink and improve the management and optimization of customer relations (Rai, P. K. et al., 2024). It is possible that traditional e-commerce techniques do not adequately reflect the dynamic nature of individual stoner gests because they often compute (Deepa, R. et al., 2022) based on immobile data (Pandey, D. et al., 2024) and generalized stoner bios. When there is a discrepancy, brain-computer interfaces (BCIs) provide input in real-time, which enables the modification of

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