Chapter 2
A Qualitative Study of the Intention to Use Smart Hybrid Electric Vehicles in an Oil-Rich Country

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ABSTRACT

Current research aims to investigate the experts' opinions on the key factors (KFs) influencing the intention to use smart hybrid electric vehicles (SHEV). The objective is to systematically compile the psychological, social, and cultural attributes and present a comprehensive taxonomy of these key factors. The study employs a content analysis approach to compile experts' opinions addressing key factors related to the intention to use SHEV in an oil-rich economy. Through an in-depth analysis of the identified key factors in interviews, a taxonomy comprising 40 key codes is formulated. These codes are classified into ten main themes. The significance of this study lies in the development of a taxonomy that organizes knowledge, provides a common language, and offers researchers a conceptual framework for clear navigation and easier comprehension when categorizing key factors and establishing relationships between these categories.

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1. INTRODUCTION

Given the rapid increase in urban populations and the expectation of sustained expansion in the coming years, the development of Information and Communication Technology (ICT) becomes a decisive force in determining the course of potential smart city ecosystems (Buhaug & Urdal, 2013). Smart cities, which tackle a wide range of urban issues, including energy, transportation, environmental concerns, governance, and citizen participation, have a significant impact on the way in which modern urban life is experienced (Ismagilova et al., 2019). The incorporation of ICT into the transportation sector not only enables the operation of smart systems but also provides strategic resolutions to pressing concerns, including travel duration, energy conservation, and ecological sustainability. The advent of Smart Hybrid Electric Vehicles (SHEVs), as described by Chehri and Mouftah (2019), represents a critical turning point in the development of smart transportation in the context of sustainable and smart urban environments. In order to adequately facilitate the shift towards smart transportation, it is crucial to develop a thorough comprehension of the factors that influence the adoption of emerging technology such as SHEVs, as these factors significantly affect the complex dynamics of user acceptance. Moreover, these factors are recommended to be taken into consideration when creating metrics for Technology Acceptance Models (TAM) and assessing user willingness to adopt cutting-edge technologies.

Iran, as a developing nation, grapples with severe air pollution challenges, particularly in its megacities. Notably, the government has been able to sustain low fuel prices, facilitated by fixed pricing mechanisms that remain significantly below market levels (from $0.1 to $0.3 per liter from 2017 to 2022). Although this policy has stimulated demand, particularly among eligible vehicle owners who have received subsidized petrol prices, it has also led to inefficient usage, as evidenced by an approximate daily average consumption of 80 million liters. Tehran, housing more than four million vehicles, the majority of which are older than twenty years, faces traffic congestion as its principal air pollution source (Shafipour and Kamalan, 2017). In light of the pressing need to address environmental pollution, it is imperative to reassess the current energy consumption framework of Iran's transportation sector, which is predominantly dependent on petrol products.

Iran is falling behind in the development of battery electric and plug-in hybrid vehicles despite the numerous advantages linked to smart and electric vehicles. At present, only Hybrid Electric Vehicles (HEVs) are offered commercially as electric alternatives in Iran (Elahi Gol et.al., 2024). Acquiring a comprehensive understanding of the ways in which prospective Iranian consumers perceive smart and hybrid vehicles, as well as the subtle elements that influence customer acceptance of SHEVs, is crucial for the reorganization of the Iranian passenger vehicle market. This understanding transcends the viewpoints of consumers and includes the assessments of producers and managers concerning novel alternative vehicle technologies, specifically in the context of developing countries that possess ample oil reserves and receive subsidized fuel prices. The evident reluctance to embrace electric vehicles underscores the necessity for exhaustive research surveys aimed at identifying the determinants that influence the adoption of smart and electric vehicles. Noticeably, research indicates that psychological factors, in addition to technical and financial considerations, exert an equally critical impact on the decision-making process and subsequent adoption of vehicles (Meghna et al., 2020).

This study aims to illuminate a frequently disregarded aspect—social-psychological factors—in an effort to comprehend the complexities associated with the adoption of smart and low-carbon vehicle technologies, specifically hybrid passenger vehicles, in Iran's fast-growing automotive industry. In pursuit of a comprehensive understanding of this uncharted domain, we conducted astute interviews with