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# Sustainable Innovation- Entrepreneurship Framework for Pilgrimage Tourism Design in Tamil Nadu

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## Abstract

*Pilgrim tourism is a significant contributor to the tourism industry and has a positive effect on the economy in terms of generating jobs and maintaining cultural heritage. In Tamil Nadu, there are a large number of temples and spiritual heritage sites, therefore making pilgrim tourism very important to this region. Furthermore, the pilgrim tourism market provides a wealth of economic prospects for the state of Tamil Nadu, but also faces numerous challenges such as environmental pollution, congestion in cities and tourist areas, and the commoditization of the culture. This paper presents a new Sustainable Innovation and Entrepreneurship Framework for the Design of Pilgrimage Tourism in Tamil Nadu that fuses together both Economic Development and Environmental Sustainability. The framework will serve to develop a responsible pilgrimage ecosystem to create a more sustainable, accountable, and responsible community by recognizing the importance of Social Entrepreneurship, Community Engagement and Accountable Governance. The framework includes Green Innovation principles, Circular Economy principles and Maqasid Al-Shariah principles for a more inclusive and value-added approach to developing pilgrimage tourism. The analysis of the literature and the design science research method offered in this study are utilized to create a model that examines the relationship between Sustainable Service Innovation, Destination Image, Service Quality and Tourist Loyalty. Digital Tools, like AI/arial/virtual and augmented reality, have been recognized as potential strategic enablers in terms of better managing cities and their visitors through the implementation of smart technologies, while also conserving resources. Modelling shows that collaboration among stakeholders/governmental support, in addition to building capacity, is very important for sustainability. This creates a framework for policymakers/developers/entrepreneurs to enhance resilience, protect cultural heritage, and promote sustainable environmental responsible development in Tamil Nadu.*

**Keywords:** Pilgrimage Tourism, Sustainable Innovation, Entrepreneurship, Smart Tourism, Tamil Nadu

## Introduction

Pilgrimage tourism has become an important global trend and has many unique challenges associated with this type of travel that can impact its sustainable development.

Pilgrimage tourism is extremely complex, incorporating spiritual, cultural, and economic aspects (Shinde & Olsen, 2022). Because the above-mentioned complexity characterizes pilgrimage tourism, establishing a comprehensive framework created from both innovation and entrepreneurship to guide the promotion of sustainability in pilgrimage towns and along historic routes (Shinde & Olsen, 2022) will be integral to manage (creating and developing) pilgrimage tourism in a sustainable manner. This paper proposes a framework that incorporates innovative entrepreneurial-based strategies and methodologies where pilgrimage tourism can create heritage-led rural renewal and enable sustainable socio-economic development of local communities, in addition to providing of long-term economic viability for local communities through travel (Candeloro & Tartari, 2025). The framework is created to provide a remedy for the vacuum that exists between traditional pilgrimage activities and modern sustainable development objectives to ensure modern pilgrimage activities provide pilgrims with economic benefits that are culturally pure while they remain ecologically harmonious (Senbeto, 2023). Therefore, this framework will examine the manner in which social entrepreneurship can be utilised to transform the manner in which local communities are empowered to create and facilitate authentic tourist experiences and enhance the connectivity of pilgrim sites through an increase of pilgrim participation in the local economy (Lupton & Samy, 2022). In this section, the concept of sustainable innovation and entrepreneurship is explored as it relates to the tourism sector as a whole, specifically with a focus on their application within the pilgrimage tourism context. In order to successfully tackle the challenges of pilgrimage tourism (such as dealing with large numbers of tourists and maintaining the spiritual essence of pilgrimage sites), we must understand the dual nature of the two concepts and utilize creative solutions (Peng & Lin 2016; Senbeto 2023). The model also shows that faith can inspire eco-friendly innovations by impacting the way organizations operate and influencing how the tourism industry practices environmentally sustainable behaviors (Senbeto 2023). The model acknowledges that there's a growing awareness that "sustainable tourism" encompasses more than just environmental aspects, but will also include the sociocultural and economic aspects of sustainability, particularly in rural communities that are frequently home to pilgrimage sites (Maziliauske 2023). Therefore, making advances in sustainable entrepreneurship and innovation in pilgrimage tourism may help mitigate adverse effects and promote long-term sustainability of these sites with cultural significance (Aquino et al., 2018ö

Through this research, a contribution will be made toward the development of an alternative way of thinking about economic practice with regard to how green innovations are appreciated and added to in society and within communities by developing green knowledge; skills; and attitudes to encourage social and environmentally responsible business (i.e., responsible energy use and waste management) (Senbeto, 2023). In addition, the theoretical foundations for the development of a holistic understanding of the impact of past efforts on the economy; society; environment; and ethics through a convergence of theoretical foundations based on the Triple Bottom Line; Maqasid al-Shari'a; and Community-Based Tourism are provided for when examining the impact of past activities on these areas (Romalee et al., 2025). This holistic perspective allows for a comprehensive understanding of both supporting the sustainable operations of business within the tourism industry and developing sustainable forms of tourism at pilgrimage destinations (Aquino et al., 2018ö

In order to apply this framework successfully, it is necessary to develop a policy matrix that will transform or translate these identified values into quantified objectives and implementation strategies for different sectors (e.g. health, education, economic equity) (Romalee et al., 2025). The policy matrix will ensure that preservation of culture and community involvement will always be a priority, and will therefore provide policy makers and industry players with a strategic view

(Azmi, 2024). The framework of pilgrimage tourism models “inclusive of identifying core values of stakeholders” (Timur pg. 2025) recognizes religion as a key aspect of pilgrimage tourism with implications for sustainable development. A holistic approach therefore is required to halal tourism, where Shariah compliance is not simply about transactional attributes but also encompasses social justice, environmental and long-term economic sustainability through the integration of Maqasid al-Shariah into sustainable business practices (Soehardi pg. 2025). A further dimension will be the need for strategic policy frameworks and fair trading practices to safeguard traditional artisanry and contribute to long-term economic development for local communities (Singgalen pg. 2025). The conceptual framework illustrates that compliance to only the religious rituals is insufficient, as environmental sustainability and ethical governance must also be fundamental elements of policy and implementation strategies, in order for pilgrimage tourism to achieve true sustainability (Romalee pg. 2025).

To ensure a developing a holistic strategy for long-term sustainability for pilgrimages, we must take into account factors from both an economy and environment perspective, as well as ethically based on Islamic principles and the entrepreneurial spirit. By examining how a circular economy supports the reusing, recycling and regenerating of materials (as outlined by Pandikar et al., 2024), we can establish ethically based pilgrimage tourism that fosters innovation through incorporating Maqashid Syariah values into an entrepreneurship framework surrounding pilgrimage tourism (as established by Mustaqim, 2023). The overall impact of combining these two focuses creates long-term sustainable pilgrimage tourism in an ethically responsible way; also creating a transition to society for all participants in pilgrimage tourism; ethically based pilgrimage tourism development will create a balance and justifiable transition into society (also that was provided by Mustaqim, 2023 and Rashid et al., 2025). Furthermore, using the Maqashid Syariah values to support green economy approaches like renewable energy use and environmentally sustainable waste management solutions will be vital to achieving global sustainability in the halal industry (also according to Mustaqim, 2023 & Tubastuvi, Ramadani, 2025). This will also allow for the proper management of natural resources and foster equitable wealth distribution; which are central tenets of Islamic economic thought (also a>>>??A

In this way, this complete system puts the importance of Islamic finance as well as ethics in a place that can help promote sustainable development in the pilgrimage tourism sector; thus focusing on social benefits and sustainability over time (Mustaqim, 2023; Pandikar et al., 2024). This relates to the Maqasid Shari’ah by ensuring that the basic tenets of Islam through the Maqasid are used to protect the faith, life, intelligence, progeny and wealth; therefore using the concept of green economy for human welfare and protection of the environment (Tubastuvi & Ramadani, 2025). In addition, creating sustainable value chains in the halal industry is critical to creating synergies with overall objectives for sustainability, creating responsible consumption and achieving the United Nations (UN) Sustainable Development Goals (Qadir et al., 2025). This means using a complete system for creating Shariah compliant tourism law to achieve a balance between Shariah compliance and compliance with international tourism market requirements (Arsad et al., 2025). Such strong synergies will ultimately provide a best practice model for other religious tourism destinations worldwide (Salem, 2025) through economic development, environmental protection, as!

The sophisticated paradigm provides a possible large impact of Islamic economics for sustainable economic development, utilizing ethical behaviour, social justice and environmental preservation. These are parallel to the definition of green economy (Aam & Muhammad, 2022).

Therefore, this paradigm gives an entire roadmap for pilgrimage tourism that is consistent with the teachings of the religion and promotes environmental preservation and social justice (Rusydia et al., 2022; Siregar et al., 2023).

## Literature Review

International tourism has grown substantially over the past decade. Every year there are over 300 million people who undertake pilgrimages around the world. This highlights the urgent need to establish frameworks that counter negative impacts while providing maximum socio-economic benefits (Moscatelli, 2024). The significance of heritage to the identity of these sacred pilgrim routes underscores the need to develop and implement sustainability-indicators for developing, formulating, and evaluating effective cultural tourism and pilgrimage tourism-related policy. However, in the context of cultural tourism — and specifically in pilgrim tourism — integrated sustainability indicators are in their infancy (Moscatelli, 2024; Zubiaga et al., 2024). There is a deficit in research on this subject and a need for a holistic approach that looks beyond economic viability and environmental sustainability; it should also consider the sociocultural underpinnings of

The need for a model that guides the integration of spiritual, cultural and environmental issues in order to sustain pilgrimage sites (Romalee et al., 2025; Soehardi et al. 2025). The way in which Islamic ethics, sustainability and community-based tourism interact, as well as the potential of halal tourism to enhance community well-being will also support the development of initiatives incorporating spiritual and social responsibility into halal tourism operations (Setiawan et al., 2024). The relationship between halal tourism, the facilities provided to Muslims, including halal food and prayer rooms, and sustainability, needs to be assessed to determine the sustainability of halal tourism (Romalee et al. 2025).

The Halal market has grown at an exceptional rate, and it is expected to exceed \$3 trillion by 2030. Due to the development of the Halal market, it is critical for corporations to build their foundation on sustainability through the use of not only regulations but also faith-based and business-based reasons. This means that companies will need to think differently on how to move forward with a plan as to what they want from the Halal tourism industry. Companies must begin to think about building their businesses along with their communities rather than only working for the purpose of gaining the maximum amount of financial gain from the organization. The research shows that even though there is rapid growth of the Halal tourism industry, there is a very large gap in terms of the sustainability model that exists at this time.

The fast-changing nature of the world requires an innovative and entrepreneurial framework to help halal tourism businesses develop more sustainable and ethically sound operational practices, especially in developing countries. This framework will leverage innovation-related technologies (artificial intelligence, augmented reality, virtual reality) to improve accessibility to halal tourism, foster cultural engagement, and connect halal tourism with other types of tourism. The framework will also provide halal entrepreneurs with creative means to market their business (Azam et al., 2027; Battour et al. , 2022). As a way of reinforcing the ethical foundation of Islamic banking and Islamic finance, extending the definition of halal certification will ensure that halal businesses are environmentally responsible and can achieve operational efficiency (Pratama, 2025). Creating a comprehensive strategy to incorporate Sharia values into the overall tourism experience will be essential for creating a vibrant halal tourism industry to support developing nations, protect cultural heritage, and promote ethically-based forms of tourism (Irawan, 2025; Sukma et al., 2026).

There are many opportunities for Halal Entrepreneurs to innovate through the creation of new Shariah-compliant products or services that benefit both the Muslim community and non-

Muslim communities similarly. Furthermore, as “Halal Travel 2.0” emerges, businesses within this industry will evolve rapidly leveraging the widespread introduction of New Technologies such as AI, Augmented and Virtual Reality, creating business opportunities within this growth market - becoming a major driver of innovation within the industry (Battour et al,2021). Therefore, it is critical to ensure that these two areas of ethical practice & new technology are integrated together to establish halal tourism as the leader within this space when providing for the responsible & sustainable development of tourism (Battour et al,2021).

The improvement of technologies will give greater individualisation and immersion to the pilgrimage travel experience, along with increasing company efficiencies and increasing sustainability efforts (Battour et al. 2021). The combination of these latest types of technology is important for the development of new Halal products and services for a rapidly changing demographic of both Muslim and Non-Muslim travellers and the creation of new avenues of continued growth and relevance in the market (Battour et al. 2021). The fast pace of technological advancements in various industries, especially in tourism, has put added emphasis on combining technologies to improve the travel experience of Muslim travellers while in the while going on a pilgrimage (Azam et al., 2024).

## Methodology

This paper uses design science to develop and evaluate an Authenticity Business Model Canvas specifically for sustainable pilgrimage tourism (Ferreira et al., 2023). The purpose of this canvas is to help identify and develop opportunities focused on providing both sustainable pilgrimage experiences for tourists and developing those experiences at the places they visit (Ferreira et al., 2023). The design science approach provides validity to the framework, ensuring the framework can be used to create innovative business models to support local communities and maintain the integrity of the pilgrimage site (Abreu et al., 2024).

The proposed model will integrate customer loyalty into sustainable innovative business practices in the pilgrimage tourism sector by using constructs of authenticity to construct objective, constructive and existential authenticity to develop a model that integrates customer loyalty with innovative and sustainable business practices (Ferreira et al., 2023) and the creation of a holistic framework using systematic literature review as a mechanism for developing a theoretical foundation for sustainable innovation in businesses related to pilgrimage tourism in terms of previous knowledge of sustainable tourism, innovation and entrepreneurship (Agrawal et al., 2024; Santos et al. (2019). The framework will also take into consideration modern tourism industry methodological and trend developments such as qualitative, quantitative and mixed methodology in addition to quantitative methodologies through both descriptive and exploratory analysis. This will contribute to the understanding of the extensive and complicated interdependencies in sustainable tourism; thereby enabling all forms of entrepreneurship to create a holistic solution to cur./É25JL

Not only does the study intend to explore relationships between sustainable service innovation, halal service quality, destination image and revisit intention, loyalty, and word-of-mouth for tourists (Sukma et al., 2025) but also to identify the main determinants of tourist satisfaction and advocacy within halal tourism, including the potential mediation effects between satisfaction and revisit intention (Sukma et al., 2025). Finally, this creative research design is expected to produce meaningful recommendations for constructing a holistic and sustainable innovation-entrepreneurship model designed to particularly respond to the unique characteristics of pilgrimage tourism with an emphasis on balancing economic viability and socio-environmental responsibility (Amalia et al., 2024; Erschbamer & Olbrich, 2024; Ferreira et al. 2023). As a more specific project

objective, this study aims to incorporate sustainability-related variables into current behaviour theories like the Theory of Planned Behaviour in order to develop more complete empirical models of behaviour and to fill in missing pieces in literature (Sukma and others, 2023).

Using Structural Equation Modeling via AMOS, this research will evaluate the relationship between how people view the environment, how motivated they are to travel, and what they do as tourists. It will also provide a comprehensive analysis of all these variables and their relationships specifically related to pilgrimage tourism (Jameel et al., 2025; Zulvianti et al., 2023). Multiple models were tested using SmartPLS to evaluate the validity of the proposed models, the indicators measuring each model, and the associated null hypotheses for them. This statistical technique is widely used in predictive analysis of causation of latent constructs, giving good accuracy in testing the relationships between construct and their effects on destination sustainability (Permana & Adam, 2024; Sukma et al., 2025). The results will be valuable for those involved in the planning and development of tourism because it will yield more accurate information on the factors affecting tourist behaviour and the sustainability of tourist destinations.

Employing both direct and indirect relationships across data offers researchers an improved understanding of the interrelationship between variables and the need to examine these variables to determine both their impact on one another regarding the validity of information as well as their influence moving forward within the pilgrimage tourism context (Habibi et al., 2024; Permana & Adam, 2024). There will be four constructs included within the model created via the use of pre-existing validated scales from existing literature (Sukma et al., 2025): sustainable service innovation; destination image; halal service quality; and tourist trust.

## Discussion

In this section we will strategically evaluate the significance of using some of the results of the prior section to help formulate resilient ethical pilgrimage tourism ecosystem through the application of the proposed framework and technology innovations. The proposed framework will take a holistic view focusing on balanced innovation that will include ethical considerations; governance functions; environmental sustainability; and, it is in a manner that is compatible with human centered development strategies and green technologies (Chhabra et al., 2025). We will also evaluate how future technologies, (augmented virtual reality), will enhance the pilgrim experience and reduce the negative environmental impacts associated with increased numbers of physical visits (Alsharif et al., 2024; Prihandini et al., 2023; Rane et al., 2023).

Through the use of technology, virtual travel experiences can contribute to reducing carbon emissions and promoting the preservation of our planet's resources, while raising awareness of vulnerable ecological surroundings (Buhalis et al., 2024). Similarly, individuals visiting religious places may find their experience enriched by the use of AI (Artificial Intelligence) based recommendation systems that create a unique and personalized experience at a faith-based location (Alsharif et al., 2024; Qasimi, 2024). Ethical issues with respect to the utilization of technology and data privacy, technology infrastructure, and social justice must be examined closely in order to develop technology that is beneficial to all members involved in the pilgrim community while at the same time preserving the sanctity of the pilgrimage experience (Islam, 2024; Reddy & Sailesh, 2024). Therefore, it will be important to create a balance between technological development and respect for humanity, to achieve an alignment of values relating to the traveler and a holistic view of the traveler that us

A balanced integration of traditional and modern spiritual practices will allow for the benefits of technological growth to coexist alongside the intrinsic spiritual/cultural benefits associated with the act of pilgrimage, creating a new form of tourism that enriches lives and preserves cultural

integrity (Lemy et al., 2025; Pooja, 2025). In addition, emerging AI tools like ChatGPT represent an opportunity to move past traditional tourist itinerary constraints and create customized spiritual journeys for individuals (Nair et al., 2024) that meet their spiritual goals, wish lists, and preferred travel dates. AI-based tools also have the capacity to democratize access to various religious traditions and knowledge through culturally responsive and inclusive experiences at sacred locations, if ethical guidelines for responsible use are put into place (Ghaith, 2024; Martín et al., 2025). These guidelines are crucial for avoiding additional barriers of disparity as a result of new technology's capital-intensive nature, so that smaller innovators do not miss out on technological advancements (Engström & Engelschiøn, 2025).

Through its involvement in environmental studies, artificial intelligence has the capability of significantly improving climate prediction accuracy and increasing awareness of the negative effects of tourism upon the environment, which could help create ecotourism opportunities (e.g., Chanda et al., 2023). Additionally, AI's transformative potential includes creating innovative models that evolve sustainable tourism initiatives by specifying how artificial intelligence and data analysis can enhance theoretical advancement of sustainable tourism (e.g., Demir & Demir, 2023). However, it is vital to recognize that, although AIs may reveal insights and enhance accessibility, they cannot completely encapsulate the intricate and layered experience of traveling to a given location in person or the individual input from a human spiritual guide (e.g., Umbrello, 2023). Instead, AI must be utilized as an instrument that enhances the breadth of one's insights through providing more opportunities for people to gain knowledge about the different aspects of faith and spirituality; therefore AI does not replace the unique and inherent nature of each person's Spiritual experiences by offering a single, all-encompassing degree of technology-based experiences and understanding (e.g. B

As an example, AI can aid researchers in analyzing texts from antiquity by finding patterns and creating interpretations that can be combined with other interpretations of the same material using AI to add new layers of meaning (Umbrello, 2023). The multidisciplinary approach that combines religious studies with computational analysis may allow researchers to develop a richer and more contextualized understanding of religious stories and traditions. Additionally, using AI's ability to process natural language can help create overly sophisticated 'chatbots' to provide instant information and personalized recommendations, thus enhancing the overall experience for pilgrims, not superseding it (Lias et. al, 2025). Therefore, incorporating AI should be viewed as a way to enhance rather than detract from human agency and spiritual discernment as part of the pilgrimage experience (Ovando et al., 2024).

## Conclusion

The purpose of this research paper is to show ways in which smart technology and sustainable practices can be used together to create a wide range of solutions in pilgrimage tourism. By examining the use of innovation along with ethical considerations for the management of both types of innovations, it demonstrates the need for managing the total solutions being developed for the development of sustainable tourism. This paper also shows that developing sustainable tourism requires the human and machine use of intelligence to successfully address complex issues that create vital information for tourism researchers and decision-makers (Ovando et al., 2024).

The holistic approach promotes protection of natural resources, and cultural heritage sites, while simultaneously reducing costs and promoting fair access to pilgrimage tourism sites, thereby supplying a basis for sustainable tourism practices. The approach utilizes intelligent technologies that include AI and IoT, and data analysis, to facilitate successful tourist management, as well as monitor environmental conditions, and create a virtual experience to accommodate pilgrims based

on the smart and sustainable ecotourism trend (Zhang & Bin, 2024). These new system features provide personalized experiences that delight visitors, and at the same time, foster community development and stimulate economic growth in pilgrimage tourism destinations (Lemy et al., 2025; Reddy & Sailesh, 2024).

According to Rane et al. (2023), through the use of AI-powered analytics, an organization can identify areas of potential tourism growth that may then be managed with the implementation of dynamic pricing systems and access controls that protect sacred sites while creating exemplary visitor experiences. AI-powered analytics systems bring multiple benefits through their ability to enhance user experiences while achieving operational efficiency through their capacity to monitor ecological impacts in real time which helps organizations achieve their environmental goals according to (Das, 2024; Islam, 2024). The present approach establishes a boundary that extends beyond ecological control because it protects cultural heritage by using AI technology to increase heritage knowledge and provide tailor-made visitor experiences through personalized visitor services according to (BENBRAHMI & MEHOR, 2025; Martín et al., 2025). The Metaverse creates an immersive experience which enables users to explore virtual sacred sites through AR and VR technologies that adapt to their personal preferences, which boosts user interaction and may affect their travel choices □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

Digital accessibility improves accessibility to travel services which create profitable solutions for environmentally friendly travel in sustainable tourism (Uçgun, 2024). The technologies enable the tourism industry to reduce environmental impact through remote working solutions while they improve resource management capabilities of smart cities (Uçgun, 2024). The new paradigm allows people to create interactive pilgrimage experiences which they can access from any location without needing to travel to specific sites (Suanpang & Pothipassa, 2024). Metaverse technologies for pilgrimage tourism enable people to experience sustainable development goals through virtual cross-cultural interactions which do not require them to travel physically (Tran, 2024).

Digital technologies, particularly blockchain technology and AI (artificial intelligence), provide an important foundation for sustainable tourism as they help visitors engage in experiences that allow cooperation with other visitors as well as the sharing of cultural practices (Tran, 2024). By combining the Metaverse with these technologies (blockchain and AI) a secure decentralized platform is created for visitors, providing a full experience for users, while also preserving the value of the location and assisting in solving overtourism issues (Abramov et al., 2024; Qadir & Fatah, 2023 & Uçgun, 2024).

Digital transformation is creating new opportunities to connect with people and developing predictive maintenance and conservation strategies using data and connecting heritage protection to sustainability. The strategic application of Artificial Intelligence (AI) can help mitigate some of the negative impacts of tourism regarding carbon emissions produced by transportation, water being wasted, etc., through the use of AI as a management tool for controlling tourist flow and optimising existing resources. The introduction of the metaverse and its associated technological developments hold enormous potential for protecting our cultural and archaeological heritage by allowing visitors to view sites virtually, thereby preventing damage to these sites caused by overcrowding, while at the same time maintaining the cultural and archaeological integrity of these sites for future generations. The advances in technology provide dual value to tourism by enhancing tourists' travel experiences while conserving our cultural heritage for future generations.

Artificial Intelligence blended with heritage tourism can position cultural heritage in new ways by utilizing advanced technology such as machine learning and generative models to preserve, increase access to, and promote environmentally sustainable practices with respect to heritage tourism (Martín et al., 2025). The use of artificial intelligence supports sustainable development

through the promotion of tourism as a means of reducing negative impacts on the environment and protecting sites of cultural significance in support of achieving Sustainable Development Goals 8, 9, and 11 (Dávid & Dadkhah, 2023). While AI technologies, when applied to heritage tourism, incorporate only technological advancements into the preservation of heritage tourism sites, they are also able to support the broad-based protection of heritage tourism by providing a comprehensive system for supporting the preservation of cultural heritage and heritage tourism (Wang et al., 2025). By using digital twin technology, heritage tourism sites can provide interactive, multi-sensory experiences for visitors while enhancing their understanding through the provision of customized recommendations for accessibility (Akyol & Avci, 2025).

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