STATE OF DIGITALIZATION IN LIFESTYLE APPAREL INDUSTRY

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ABSTRACT

Objective: The objective of this research study was to assess the extent of digitalization in the Lifestyle Apparel Industry and identify any loopholes in the ideal supply chain management. The study aimed to examine the integration of retailers with their partners, the understanding of key industry trends, and the decision-making process regarding the right retail format and digitalization level.

Method: This research adopted a descriptive approach, combining quantitative and qualitative methods. A sample of 80 Lifestyle Apparel Retailers from the Mumbai region was selected using a simple random sampling procedure. Data was collected through surveys and interviews to gather insights into the utilization of technology platforms in the industry.

Result: The findings of the study revealed that Universal Product Coding, Unified Payments Interface, E-Commerce platforms, ERP Solution, and Loyalty Programs are the most extensively used technology platforms in the Lifestyle Apparel Industry. These platforms have significantly transformed the supply chain process, enhanced customer experience, and improved operational efficiency.

Conclusion: In conclusion, this research highlights the pivotal role of technology in shaping the Lifestyle Apparel Industry. The adoption of various technology platforms has empowered retailers to optimize their operations, enhance customer engagement, and remain competitive in the market. The study also points out the importance of integrating retailers with partners, understanding industry trends, and making informed decisions to achieve an ideal supply chain management in the digital era. These insights are valuable for industry stakeholders and policymakers to drive further advancements and growth in the Lifestyle Apparel sector.

Keywords: lifestyle apparel industry, AI, 3D Printing, ERP, RFID, IoT, AR, VR.

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MATERIAL DE APRENDIZAGEM NA INDÚSTRIA DE VESTUÁRIO DE ESTILO DE VIDA

RESUMO

Objetivo: O objetivo desta pesquisa foi avaliar a extensão da digitalização na Indústria de Vestuário de Estilo de Vida e identificar quaisquer lacunas na gestão da cadeia de fornecimento ideal. O estudo teve como objetivo examinar a integração dos varejistas com seus parceiros, a compreensão das principais tendências do setor e o processo de tomada de decisões em relação ao formato de varejo e ao nível de digitalização corretos.

Método: Esta pesquisa adotou uma abordagem descritiva, combinando métodos quantitativos e qualitativos. Uma amostra de 80 varejistas de roupas de estilo de vida da região de Mumbai foi selecionada usando um procedimento de amostragem aleatória simples. Os dados foram coletados por meio de pesquisas e entrevistas para coletar insights sobre a utilização de plataformas de tecnologia no setor.

Resultado: Os resultados do estudo revelaram que a Universal Product Coding, Unified Payments Interface, plataformas de e-Commerce, ERP Solution e Loyalty Programs são as plataformas de tecnologia mais usadas no setor de vestuário de estilo de vida. Essas plataformas transformaram significativamente o processo da cadeia de fornecimento, melhoraram a experiência do cliente e a eficiência operacional.

Conclusão: Em conclusão, esta pesquisa destaca o papel fundamental da tecnologia na formação da Indústria de Vestuário de Estilo de Vida. A adoção de várias plataformas de tecnologia capacitou os varejistas a otimizar suas operações, aumentar o envolvimento do cliente e permanecer competitivos no mercado. O estudo também destaca a importância de integrar os varejistas com parceiros, entender as tendências do setor e tomar decisões informadas para alcançar um gerenciamento ideal da cadeia de fornecimento na era digital. Esses insights são valiosos para as partes interessadas do setor e os formuladores de políticas visando impulsionar novos avanços e crescimento no setor de vestuário de estilo de vida.

Palavras-chave: indústria de vestuário de estilo de vida, IA, impressão 3D, ERP, RFID, IoT, AR, VR.

1 INTRODUÇÃO

O setor da indústria de vestuário é uma parte essencial da civilização humana, servindo como uma necessidade fundamental junto com alimentos, água e abrigo. No Índia, ele é a segunda maior indústria após o IT, cobrindo roupas para homens, mulheres e crianças, bem como várias subcategorias como roupas formais, roupas casuais, roupas indianas, esportivos e acessórios. Com um mercado em crescimento e um orçamento projetado de $31.28 bilhões USD em 2023, o setor de roupas para homens está testemunhando crescimento substancial a um ritmo de 3.65% por ano.

Digitalização, o processo de transformar dados e processos em formatos digitais, tem emergido como uma força motriz na indústria do vestuário e moda. Esta transformação está facilitando o desenvolvimento de sistemas inovadores, sustentáveis e em tempo real que priorizam a conveniência do cliente, flexibilidade e confiabilidade. O recente pandemia
expedited the adoption of digital technology, propelling the apparel industry to embrace online shopping as a key trend and foster resilience during uncertain times.

As technology continues to revolutionize the apparel sector, there is a growing need for comprehensive research on its impact. This article aims to address this gap by conducting a systematic and thorough analysis of the existing literature on digitalization in the retail context. By evaluating previous research findings, this study aims to identify knowledge gaps and prioritize areas for future exploration, fostering a deeper understanding of how technology can bolster the growth and development of the apparel industry.

The objective of this research is to assess the scope and current state of digitalization in the Lifestyle Apparel Industry. By delving into the implications of technology adoption, this study seeks to unravel the potential benefits and challenges faced by the apparel industry. As a result, this research will offer valuable insights into harnessing digitalization's potential and facilitating sustainable growth in the ever-evolving apparel landscape.

2 THEORETICAL FRAMEWORK

For this research article on digitalization in the Lifestyle Apparel Industry, the theoretical framework draws upon two main theories: (1) Technology Adoption Theory and (2) Sustainable Development Theory.

2.1 TECHNOLOGY ADOPTION THEORY

The Technology Adoption Theory, also known as the Diffusion of Innovations Theory, provides a suitable framework to understand the process of technology adoption and its impact on the apparel industry. Developed by Rogers (1962), this theory posits that the adoption of new technologies is influenced by five key factors: relative advantage, compatibility, complexity, trialability, and observability.

In the context of the apparel industry, the Technology Adoption Theory helps to analyze how retailers and consumers perceive the relative advantage of digitalization in terms of convenience, cost-effectiveness, and enhanced shopping experience. It also examines the compatibility of digital technologies with the existing retail practices and the complexities involved in adopting and integrating these technologies into the supply chain.
Furthermore, the theory allows researchers to investigate the trialability of digital solutions, enabling retailers to experiment and assess the benefits before full-scale implementation. Lastly, the observability factor assesses the extent to which the successful adoption of digital technologies by key industry players influences the adoption decisions of other retailers, leading to a snowball effect in digital transformation.

2.2 SUSTAINABLE DEVELOPMENT THEORY

The Sustainable Development Theory provides a critical lens to explore the implications of digitalization on the sustainability goals of the apparel industry. This theory emphasizes the need to strike a balance between economic growth, social development, and environmental protection to achieve long-term sustainability.

In the context of the apparel industry, this theory enables researchers to investigate how digitalization can contribute to sustainable practices, such as reducing waste through efficient inventory management, optimizing transportation to minimize carbon footprints, and promoting transparency in supply chains to ensure ethical sourcing. It also allows for an exploration of how digitalization can enhance the social dimension of sustainability by ensuring fair labor practices and empowering workers in the apparel supply chain.

By incorporating the Sustainable Development Theory, this research article seeks to shed light on how digitalization can propel the industry towards a more sustainable future, where economic growth is harmonized with environmental and social responsibility.

2.3 INTEGRATION OF THEORETICAL FRAMEWORK

The integration of the Technology Adoption Theory and Sustainable Development Theory allows for a comprehensive analysis of digitalization in the Lifestyle Apparel Industry. By examining the factors influencing technology adoption, such as perceived advantages, compatibility, and complexity, researchers can better understand the challenges and opportunities presented by digitalization in the industry.

Furthermore, by evaluating the impact of digitalization through the lens of sustainable development, the study can provide insights into how technology adoption can contribute to achieving sustainability goals in the apparel sector. This integrated theoretical framework will facilitate a holistic understanding of the role of digitalization
in shaping the future of the Lifestyle Apparel Industry, enabling stakeholders to make informed decisions for sustainable growth and development.

3 METHODOLOGY
3.1 HYPOTHESIS
The research aims to investigate the digitalization methods adopted by the Lifestyle Apparel Industry. To guide the study, the following hypotheses are formulated:
1.1 Null Hypothesis (H0): There are no exclusive IT solutions used as a method of digitalization in the Lifestyle Apparel Industry.
1.2 Alternative Hypothesis (H1): There are exclusive IT solutions used as a method of digitalization in the Lifestyle Apparel Industry.

3.2 RESEARCH DESIGN
The research design selected for this study is a survey. The survey was conducted using a combination of telephonic interviews, personal interviews, and a self-administered questionnaire. This approach allowed for a comprehensive data collection process, enabling researchers to gather valuable insights from a diverse group of retailers in the Lifestyle Apparel Industry.

3.3 SAMPLING PLAN
A sample of 80 retailers from Mumbai was chosen for this study. Given the constraints of time and resources, a non-probability convenience sampling method was adopted. This approach provided a practical and feasible way to gather data from a select group of retailers, offering valuable insights into the digitalization practices within the industry.

3.4 DATA GATHERING INSTRUMENT
The primary data gathering instrument used in this research was a questionnaire comprising closed-ended questions. The questionnaire was designed to explore the adoption and implementation of IT solutions as a method of digitalization in the Lifestyle Apparel Industry. The questions were structured using a summated Likert rating scale, allowing respondents to provide their level of agreement or disagreement on specific aspects related to digitalization.
3.5 LIMITATIONS

As with any research study, this research has certain limitations that need to be acknowledged. Due to the limited time frame, the sample size might not fully represent the entire population of retailers in the Lifestyle Apparel Industry. While efforts were made to minimize bias and sampling errors, a certain degree of respondent bias and errors may be inevitable.

Despite these limitations, this research aims to provide valuable insights into the digitalization practices within the Lifestyle Apparel Industry and shed light on the adoption of exclusive IT solutions. The findings of this study can serve as a foundation for future research and inform industry stakeholders on the opportunities and challenges of embracing digitalization to foster sustainable growth in the apparel sector.

4 RESULTS AND DISCUSSION

4.1 RESULTS

IT Solutions: Questions related to IT Solutions are as follows:

<table>
<thead>
<tr>
<th>#</th>
<th>Type of IT program used</th>
<th>Never</th>
<th>Occasional</th>
<th>Commonly</th>
<th>Constantly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>ERP Solution</td>
<td>19</td>
<td>6</td>
<td>22</td>
<td>33</td>
</tr>
<tr>
<td>1.2</td>
<td>Inventory Planning Solution</td>
<td>23</td>
<td>7</td>
<td>13</td>
<td>37</td>
</tr>
<tr>
<td>1.3</td>
<td>Universal Product Coding</td>
<td>12</td>
<td>3</td>
<td>18</td>
<td>47</td>
</tr>
<tr>
<td>1.4</td>
<td>Supplier Relationship Management</td>
<td>24</td>
<td>6</td>
<td>16</td>
<td>34</td>
</tr>
<tr>
<td>1.5</td>
<td>AR/VR</td>
<td>34</td>
<td>6</td>
<td>12</td>
<td>28</td>
</tr>
<tr>
<td>1.6</td>
<td>Loyalty Program</td>
<td>19</td>
<td>10</td>
<td>19</td>
<td>32</td>
</tr>
<tr>
<td>1.7</td>
<td>E-Commerce platforms</td>
<td>14</td>
<td>8</td>
<td>21</td>
<td>37</td>
</tr>
<tr>
<td>1.8</td>
<td>3D fitting solutions</td>
<td>24</td>
<td>7</td>
<td>17</td>
<td>32</td>
</tr>
<tr>
<td>1.9</td>
<td>Artificial Intelligence, Robotics</td>
<td>40</td>
<td>8</td>
<td>5</td>
<td>27</td>
</tr>
<tr>
<td>1.10</td>
<td>Unified Payments Interface (UPI)</td>
<td>10</td>
<td>2</td>
<td>35</td>
<td>33</td>
</tr>
</tbody>
</table>

Source: Prepared by the authors (2023)

Using Above formula mean score are obtained for each respondent and for all 80 respondents collectively. The following are the descriptive statistics:

<table>
<thead>
<tr>
<th>Description Statistics</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Solutions</td>
<td>80</td>
<td>.00</td>
<td>100.00</td>
<td>60.7556</td>
<td>33.08272</td>
</tr>
</tbody>
</table>

Source: Prepared by the authors (2023)
The data reveals a mean score of 60.75 percent and a standard deviation of 33.08 for IT Solutions in the Lifestyle Apparel Industry. The significant standard deviation indicates a high variation in the responses received from retailers. Further qualitative exploration is necessary to understand the factors influencing digitalization decisions and the specific IT solutions adopted. Overall, the data suggests a moderate level of IT solutions adoption in the industry.

4.2 HYPOTHESIS TESTING

- **Null Hypothesis**: There are no such exclusive IT solution(s) used as a method of digitalization in Lifestyle Apparel Industry.

- **Alternate Hypothesis**: There are exclusive IT solution(s) used as a method of digitalization in Lifestyle Apparel Industry.

The Friedman Test was utilized to test the null hypothesis described previously, and the results are presented in the following table:

<table>
<thead>
<tr>
<th>Test Statistics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>80</td>
</tr>
<tr>
<td>Chi-Square</td>
<td>136.627</td>
</tr>
<tr>
<td>Df</td>
<td>9</td>
</tr>
<tr>
<td>P value</td>
<td>.000</td>
</tr>
</tbody>
</table>

Source: Prepared by the authors (2023)

Discussion: The results indicate that the p-value for the Friedman Test is 0.000, which falls below the significance level of 0.05. As a result, the null hypothesis is rejected, and the alternate hypothesis is accepted, indicating that there is a significant difference in the variable being tested. Hence it can be seen that there are exclusive IT solution(s) used as a method of digitalization in Lifestyle Apparel Industry.

5 CONCLUSION

The results of the Friedman Test indicate a significant difference in the variable being tested, leading to the rejection of the null hypothesis. Consequently, the alternate hypothesis is accepted, suggesting that there are exclusive IT solutions used as a method of digitalization in the Lifestyle Apparel Industry.

To understand the use of IT solutions information about the types of IT solutions and its usage in percentage is given below.
Table 4: Response related to usage of IT program used

<table>
<thead>
<tr>
<th>Type of IT program used</th>
<th>Mean Percent</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERP Solution</td>
<td>69%</td>
<td>4</td>
</tr>
<tr>
<td>Inventory Planning Solution</td>
<td>63%</td>
<td>6</td>
</tr>
<tr>
<td>Unified Payments Interface (UPI)</td>
<td>81%</td>
<td>2</td>
</tr>
<tr>
<td>Supplier Relationship Management</td>
<td>63%</td>
<td>6</td>
</tr>
<tr>
<td>AR/VR</td>
<td>50%</td>
<td>8</td>
</tr>
<tr>
<td>Loyalty Program</td>
<td>64%</td>
<td>5</td>
</tr>
<tr>
<td>E-Commerce platforms</td>
<td>73%</td>
<td>3</td>
</tr>
<tr>
<td>3D fitting solutions</td>
<td>61%</td>
<td>7</td>
</tr>
<tr>
<td>Artificial Intelligence, Robotics</td>
<td>40%</td>
<td>9</td>
</tr>
<tr>
<td>Universal Product Coding</td>
<td>85%</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Prepared by the authors (2023)

The study provides insights into the usage of IT solutions in the retail format of the Lifestyle Apparel Industry. The top five IT programs used by retailers are as follows:

- Universal Product Coding / Bar Coding, utilized by 85% of retailers.
- Unified Payments Interface (UPI), adopted by 81% of retailers.
- E-Commerce platforms, employed by 73% of retailers.
- ERP Solution, implemented by 69% of retailers.
- Loyalty Program, utilized by 64% of retailers.

The findings underscore the growing significance of digitalization in the Lifestyle Apparel Industry. Retailers are increasingly adopting IT solutions to streamline processes, enhance customer experiences, and improve overall efficiency. The extensive use of Universal Product Coding / Bar Coding indicates the industry's focus on inventory management and supply chain optimization.

The popularity of Unified Payments Interface (UPI) and E-Commerce platforms reflects the industry's shift towards cashless transactions and online shopping experiences. The integration of ERP Solutions showcases the industry's commitment to enhancing operational efficiency and data management.

Moreover, the prevalence of Loyalty Programs suggests retailers' efforts to cultivate customer loyalty and enhance brand engagement.

Overall, the study highlights the crucial role of IT solutions in driving digital transformation within the Lifestyle Apparel Industry. The adoption of exclusive IT solutions paves the way for enhanced customer engagement, efficient operations, and sustainable growth in this dynamic and competitive sector. As technology continues to evolve, retailers must remain adaptive and innovative to capitalize on the benefits offered by digitalization and stay ahead in the ever-changing landscape of the apparel industry.

Information on all the IT programs results is presented in the following bar graph:
The research demonstrates that technological advancements have significantly impacted various aspects of human life, making tasks that were once unimaginable now achievable with ease. The Lifestyle Apparel Industry is no exception, where digitalization has played a pivotal role in driving growth and expansion. Through digital presence via websites and social media, brands have been able to establish themselves on an international level, attracting clients from all over the world.

The findings of this research highlight that apparel retailers have begun embracing digitalization, with Universal Product Coding, Unified Payments Interface, E-Commerce platforms, ERP Solution, and Loyalty Programs being the most extensively used technology platforms in the industry. While some national and international brands have adopted cutting-edge technologies like 3D printing, AR, and VR, their usage is still in its early stages.

Digital transformation in the apparel industry spans from establishing online stores to digitalizing the complete value chain, allowing retailers to gain customers, predict and manage inventories, and offer new logistics and sales fulfilment options. This digitalization has led to the development of robust, innovative, and sustainable infrastructure catering to customers’ needs for comfort, flexibility, and reliability.
The integration of Internet of Things (IoT) technology in the apparel industry has enabled real-time monitoring of activities, health monitoring through IoT-enabled clothing and wearables, and implementation of smart security systems. Additionally, IoT-generated data allows retailers to gain insights into various aspects of the industry, enhancing analytics and predictive capabilities.

Artificial Intelligence (AI) technology assists in predicting customer behaviour patterns and offering wardrobe recommendations based on environmental factors. Furthermore, AI is utilized in predicting health conditions and making personalized recommendations for various individuals. As IoT technology expands beyond wearable devices, invisible sensors integrated into fabric and interconnected garments enable various functions, such as providing product information, loss prevention, and style recommendations.

There is considerable potential for Exclusive Brand Outlets and Multi-Brand Family Stores to explore the usage and benefits of other technology solutions. With the ability to test clothing on avatars through various apps and technology solutions, customers can make informed decisions about their purchases, enhancing their overall shopping experience.

In conclusion, digitalization has revolutionized the Lifestyle Apparel Industry, enabling retailers to provide enhanced customer experiences and drive efficiency throughout the value chain. As technology continues to evolve, there are ample opportunities for retailers to leverage digital solutions and stay ahead in this ever-evolving and competitive industry.

ABBREVIATIONS

3-D: Three-Dimensional
AI: Artificial Intelligence
AR: Augmented Reality
CAGR: Compound Annual Growth Rate
DL: Deep Learning
EBO: Exclusive Brand Outlet
ERP: Enterprise Resource Planning
GDP: Gross Domestic Product
IoT: Internet of Things
IT: Information Technology
LFS: Large Format Store
ML: Machine Learning
MBFS: Multi-Brand Family Store
RFID: Radio Frequency Identification
UPI: Unified Payments Interface
UX: User Experience
VR: Virtual Reality
REFERENCES


