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Collective Intelligence and Structural Transformation in the Moroccan Tourism Industry during the COVID-19 Pandemic: A Field Survey in the Marrakech-Safi Region

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Abstract:

This paper discusses the impact of the COVID-19 pandemic on the tourism industry, with a focus on the Moroccan tourism sector. It highlights the need for the government to reflect on the crisis's implications and foster a more resilient tourism economy through structural transformation and collective intelligence. This research defines key concepts of collective intelligence and analyzes the mechanisms of actors in the Moroccan tourism sector. The study conducted a field survey in the Marrakech-Safi region, showing that market actors have developed effective tools and methods of collective action in line with collective intelligence principles. By promoting collective intelligence, Morocco can create a sustainable and resilient tourism industry. The study's contributions can provide valuable information for similar contexts worldwide, and its findings are of interest to researchers, policymakers, and practitioners in the tourism industry.

Keywords: COVID-19; collective intelligence; Morocco; resilient tourism economy; field survey.

JEL Classification: L83; Z32; R11.

Introduction

The COVID-19 pandemic has caused a major health and economic crisis in Morocco, with serious consequences felt across the country. The Moroccan public authorities have made enormous efforts to absorb the consequences, but the containment measures taken to limit the spread have led to a slowdown in the national economy. Experts predict that Morocco is facing three main economic and financial shocks: containment measures followed by a decline in government revenues, rising interest rates and falling phosphate prices, and the halt in tourism. The tourism sector is of crucial importance to many populations, localities, and businesses, but its disruption has had a tangible impact due to COVID-19. The crisis presents an opportunity to rethink the future of tourism, develop collective intelligence, and establish an ecosystem that considers all stakeholders. Collective intelligence is becoming increasingly important in this uncertain, complex, and ambiguous environment, allowing tasks and problems to be solved efficiently. Its application can improve not only economic but also global performances. However, its implementation requires a specific number of rules conducive to its emergence and a change in the attitude of leaders and managers at various levels. Therefore, it is crucial to promote collective intelligence and its application in the tourism sector to ensure a brighter future for the industry. This article aims to

explore the potential of collective intelligence in the tourism sector in the post-COVID-19 era, highlighting its benefits and challenges.

1. Literature Review

1.1. Unlocking the Power of Group Intelligence: A Comprehensive Framework for Collective Intelligence

Collective intelligence is a complex and multidisciplinary concept that has been studied by scholars from various fields, including social sciences, communication and information sciences, psychology, and more. In social sciences, Simon (1969) defines collective intelligence as the process of researching and interpreting information to construct a shared understanding of the environment. Moreover, according to Courbon (1979), the collective intelligence of an organization refers to its ability to gather and combine various perspectives on its activities and environment, as perceived by its members, to guide its conscious development. This ability to acquire knowledge is what defines an organization's collective intelligence.

Similarly, for Glynn (1996), collective intelligence is the ability of an organization to effectively manage, interpret, manipulate, and access information with a specific goal in mind. This capability allows the organization to enhance its adaptability within its operating environment. In contrast, Ribette (1996), explains that collective intelligence differs from the sum of the individual intelligences that compose it. Meanwhile, Rabasse (1997) describes collective intelligence as the effective utilization of individual skills to create a synergistic impact that helps achieve a shared goal. Furthermore, Mack (2004) presents collective intelligence as the capacity to produce superior value, performance, or results by combining and interacting the knowledge, ideas, opinions, questions, and doubts of multiple individuals, rather than simply adding up their individual contributions.According to Zara (2004), collective intelligence can enhance an organization's accountability, creativity, and adaptability, while also ensuring that decisions are effectively implemented by minimizing resistance to change and fostering a positive competitive spirit.

Furthermore, the study by Sandro Georgi *et al.* (2012) aimed to develop a comprehensive model of collective intelligence based on available literature, with a focus on identifying key characteristics that could be used to describe collective intelligence in a more universal way. The authors identified a lack of research on this topic and sought to address this gap by synthesizing existing models of collective intelligence and proposing a set of novel characteristics that could be used to describe this phenomenon.

In addition, Aelita Skarzauskiene *et al.* (2015) define collective intelligence as a system that requires a minimum potential to transform community projects. To quantify this potential, the authors investigate engagement and participation trends in online communities in Lithuania. They propose three levels/measures that a community project must fulfill to be considered a collective intelligence system and put forward a conceptual framework for assessing the potential of collective intelligence and calculate a CI Potential Index to help developers and initiators of community projects assess their potential. According to Kurt Matzler *et al.* (2016) collective intelligence is the ability to harness the power of the crowd within organizations by creating cognitive diversity, promoting independence, accessing decentralized knowledge, and effectively aggregating knowledge. They argue that although end-user platforms such as wikis, blogs, and prediction markets are useful for tapping into the wisdom of the crowd, they are insufficient for promoting collective intelligence within organizations. Shweta Suran, Vishwajeet Pattanaik, and Dirk Draheim (2020, 8–9) propose activities are based on the work of Surowiecki, which are illustrated with real-world examples and case studies.

Lastly, Juho Salminen (2015) defines collective intelligence as a complex-adaptive system and attempts to clarify its fuzzy nature by investigating its emergence. To achieve this, Salminen conducted a systematic literature review of published case studies discussing three CI platforms, observed user behavior on each of these platforms, and gathered relevant data (Sassi, S., Ivanovic, M., Chbeir, R. *et al.* 2022, 5–6). He proposed a new theoretical framework for CI based on available CI frameworks and evaluated it based on his observations from the previously analyzed CI platforms. The proposed framework is defined through three levels of abstraction: micro, emergence, and macro (Shweta Suran 2022, 84–85).

Then, in the field of communication and information sciences, Bonabeau (1984) uses the metaphorical term '"collective intelligence"' to refer to a social group's ability to solve a problem that an isolated agent would be unable to solve. According to Meunier (1993), collective intelligence refers to an organization's ability to fully leverage all available resources to produce high-quality products or services while establishing an equilibrium between objectives, structures, resources, and outcomes, including both strategic and operational aspects of the company. The concept is best captured by the notions of adaptation and flexibility.

Moreover, Levy (1997) describes collective intelligence as a form of universally distributed intelligence, constantly enhanced, coordinated in real-time, and resulting in the effective mobilization of skills. Moreover,

collective intelligence refers to the intelligence realized at different collective levels of the organization, if not in the whole organization; it is therefore not the sum of individual intelligences. Collective intelligence is the intelligence of work groups. For Besson (2002), collective intelligence is a multiplier of the individual intelligences of the company. It is the coordination of the intelligences of the company. Furthermore, Andre Boder (2006) focuses on the management of collective intelligence and the design of collaborative tools.

Additionaly, Thomas W. Malone *et al.* (2009) propose a new framework to explain the underlying model of collective intelligence (CI) systems. The authors examined 250 web-enabled CI systems and identified the building blocks or "genes" of CI. These genes are classified based on two pairs of fundamental questions: "Who is performing the task? Why are they doing it?" and "What is being done? How is it being done?". The authors propose the answers to these questions as the "genes" of CI systems. Different CI systems can be modeled using the combination and recombination of these building blocks. The study also examines four web-enabled CI systems and proposes that the "sequences of genes" of each of these systems can be combined into genomes that can help us to understand these CI systems better.

According to Dawn G. Gregg (2010) CI applications refer to systems that utilize the knowledge and intelligence of their users through human interaction and decision-making. The design of new CI applications must prioritize the importance and utilization of user-generated data. In his study, Gregg draws on the work of O'Reilly and proposes seven key requirements for designing effective CI applications. Martijn C. Schut (2010) proposes a modeling approach for designing collective intelligence systems. The approach consists of three phases - system design, model design, and models - and draws inspiration from self-organization, multi-agent systems, swarm intelligence, system modeling, and meta-modeling.

For Ioanna Lykourentzou *et al.* (2011), collective intelligence (CI) can be classified into either "active" or "passive" systems. In "active" CI systems, crowd behavior is created and coordinated by the system itself, and these systems can further be classified as "collaborative", "competitive," or "hybrid" systems. In contrast, "passive" CI systems involve groups of users exhibiting swarm behavior, regardless of whether the system requires it or not. The study aims to identify the common characteristics of CI systems and the challenges preventing the construction of a generic CI system. Likewise, Sandro Georgi *et al.* (2012), define collective intelligence by five characteristics: diversity, autonomy, openness, interactivity, and motivation. The authors propose these characteristics based on a comprehensive analysis of existing scientific literature and three models of collective intelligence. They argue that these characteristics provide a useful framework for describing collective intelligence in general.

In addition, Du Nguyen *et al.* (2018) describe collective intelligence as "the power of Decisions 2.0," a new concept of decision-making based on the wisdom of crowds through collaboration and collective intelligence. They propose a CI framework based on essential characteristics for a collective to be intelligent, as proposed by Surowiecki, and list four criteria that a collective must fulfill to be considered intelligent. They also propose a general CI framework for the wisdom of crowds, which includes the collective, aggregation methods, and collective performance measures.

Finally, in the field of psychology, Garnier compares collective intelligence to a process that allows a group to apprehend all the dimensions of a problem in time and space and to achieve a decision. Similarly, Goux-Baudiment (2001) defines collective intelligence as encompassing all collective operations that lead to the construction of shared reflection. According to Williams Woolley, A., Aggarwal, I., & Malone, T.W. (2015), Collective intelligence, arises from a combination of bottom-up and top-down processes. The former involves individual characteristics that enhance collaboration among group members, while the latter encompasses group structures, norms, and routines that regulate collective behavior and influence the quality of collaboration. These two aspects interact and combine to produce emergent collective intelligence, as discussed in detail by the authors.

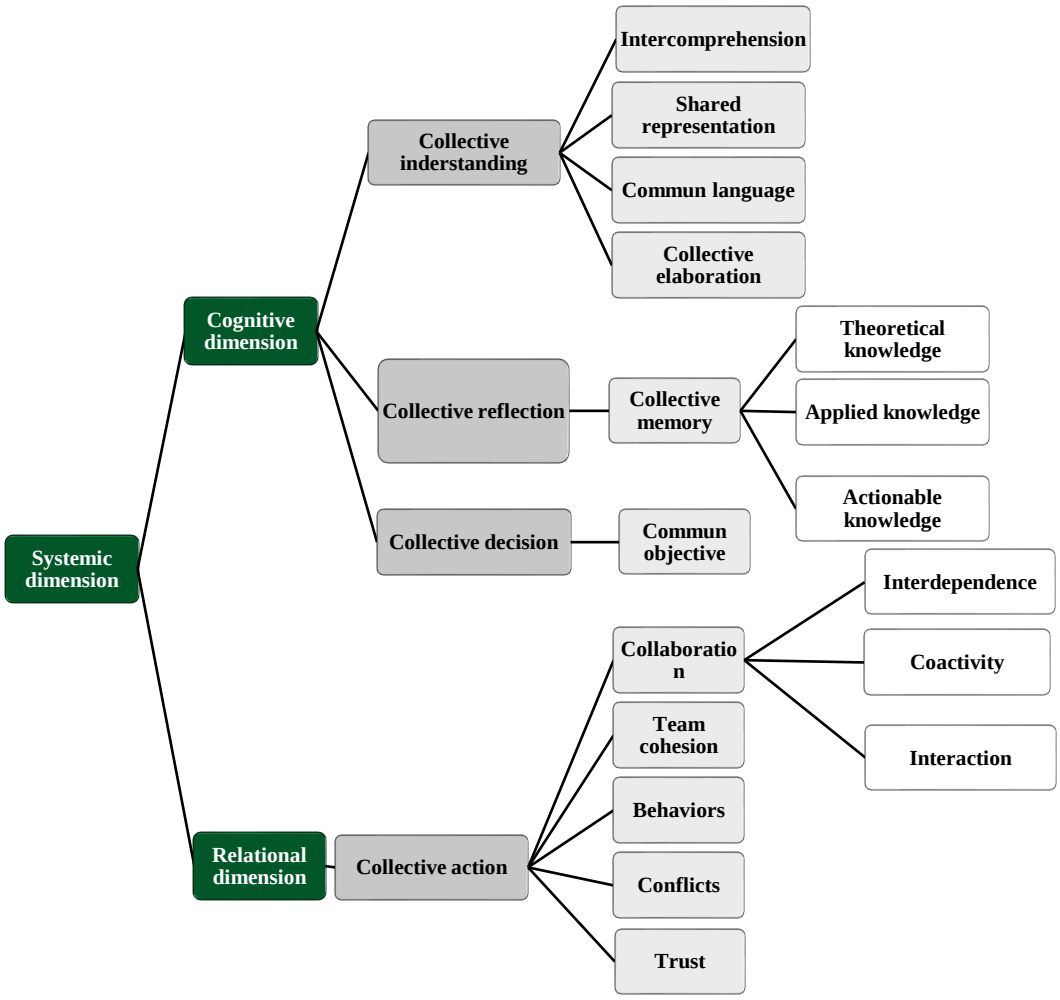
From these definitions, it is clear that collective intelligence involves the idea that each member of a community holds a part of the best answer to solve a difficulty or a problem. The solution is built progressively through free exchanges between the actors. Therefore, it is more accurate to consider that the practices to be developed are more cooperative, between peers or equals, than collaborative, whose etymology implies participation in the adjustment of a solution already defined in its broad outlines. True collective intelligence is built over time through cooperative methods.

In conclusion, collective intelligence is a vital concept that has been studied from various perspectives, and it is essential to understand its different dimensions to leverage its potential for various organizations and communities.

1.2. Key Dimensions for Identifying Collective Intelligence

Collective intelligence has been increasingly recognized as a powerful tool for solving complex problems in various domains. In this article, we build upon Surowiecki's seminal work (2008) and present a framework for synthesizing the role of collective intelligence in three dimensions: cognitive, relational, and systemic.

Figure 1. Dimensions of collective intelligence



Source: Olfa Gréselle Zaibet (2007).

The cognitive dimension of collective intelligence focuses on finding a unique solution to a problem faced by a community. It requires the stakeholders to remain independent and avoid conformism and mimicry. The collective solution is preferable when actors have diverse opinions and solutions, as it facilitates individual reflection and innovation.

The mechanisms of agent's coordination fall under the relational dimension. To prevent isolation, inequity, and hegemony, collective intelligence requires strong decentralization that promotes independence and collaboration. Coordination associated with collective intelligence ensures that a collective decision emerges.

The previous two dimensions are included in the systemic dimension, which emphasizes the importance of the individual's actions within a system. Understanding actors' interactions is essential for comprehending collective intelligence. Collective intelligence, as demonstrated by Weick (1993), is a system of collective actions that arises from analyzing the actions of others and linking them with the system.

Applying these dimensions and their components, we can identify traces of the existence of collective intelligence in the tourism sector ecosystem. The tourism industry has been facing complex problems that require a collective and collaborative approach to tackle. Our framework can serve as a guide for practitioners and researchers in the tourism industry to understand and apply collective intelligence in their work.

In conclusion, collective intelligence is a promising approach for addressing complex problems in various domains, including tourism. Our framework can help identify and leverage collective intelligence to improve problem-solving and decision-making processes in the tourism industry.

2. Methodology

After completing the theoretical part, this paper embraces a qualitative study to explore the manifestations of collective intelligence in the tourism sector of the Marrakech-Safi region, and to understand to what extent the actors of the Moroccan tourism ecosystem can be collectively intelligent, particularly in the post-COVID era. To achieve this, we gathered testimonies from different leaders and actors of the tourism industry through Semi Structured Interviews, as it is the most suitable method for this purpose. Open-ended questions related to the themes of our analysis model were used to develop the interview guide, which consisted of three main axes: defining collective intelligence, identifying its approach in the tourism sector, and applying it within an ecosystem.
In total, we conducted 10 interviews with an average duration of 40 minutes. The interviews were conducted remotely due to COVID-19 restrictions, and all were recorded and transcribed. The qualitative data were analyzed using NVIVO Software based on word clouds and content analysis, which is the most widely used method for studying interviews or qualitative observations. This analysis was based on two complementary methods, namely individual synthesis and horizontal analysis.

Table 1: Summary of data sources

Source	Position	Interview time span (minutes)
Semi Structured Interviews	Head of department in the regional tourism center	38
Semi Structured Interviews	Administrator at the regional tourism center	42
Semi Structured Interviews	Head of department at the regional tourism delegation	30
Semi Structured Interviews	administrator at the regional tourism delegation	35
Semi Structured Interviews	Tourist guide	37
Semi Structured Interviews	Hotel manager	43
Semi Structured Interviews	Restaurant manager	35
Semi Structured Interviews	Hostel manager	32
Semi Structured Interviews	Travel agency manager	40
Semi Structured Interviews	Transport company manager	35

Source: Authors

The results of our study will help to identify the conditions necessary for the emergence of collective intelligence in the tourism sector of the Marrakech-Safi region, and to establish rules for its application. This is particularly relevant in the current context of the COVID-19 pandemic, which has significantly impacted the tourism industry worldwide.

3. Case Study

3.1. Analyses and Results

- Perception of the concept of collective intelligence

Upon initial examination, it appears that the term collective intelligence was not explicitly mentioned by the interviewees. However, they did use substitutes such as collaboration, horizontal coordination, or collective performance. Nevertheless, the managers interviewed provided definitions of collective intelligence that closely align with those previously explored in this work: "the production of a consensus that allows a group to work together" or "the capacity of an organization to mobilize a group for the purpose of finding solutions." One participant also added that collective intelligence "is not the simple combination of individual intelligences, but rather what emerges from pooling several points of view."

Regarding the factors that facilitate the emergence of collective intelligence (or collaboration, as it is commonly referred to), we find trust, the need for freedom of speech, active listening, benevolence, as well as the ability to ask for help and the right to make mistakes. What emerged from all our interviews is that collective intelligence must be supported by strong determination from the organization, which must be established before it can be applied at all levels of the hierarchy. For most of the respondents, team collaboration should result from the leader's will to encourage this approach. On the other hand, not all local managers necessarily have a culture of collaboration and may sometimes hinder the spontaneous approaches that arise.

Sharing information and knowledge is also identified as the cornerstone of developing collaboration, whether within small teams, between different teams, or among actors in an ecosystem. According to the actors, the development of new forms of tourism can provide an ideal environment for the emergence of collective intelligence. Through collective intelligence, this environment would enable the efficient handling of a multitude of

actors and various actions to be undertaken. However, coordination and synergy between actors and tourism professionals may pose challenges in providing greater visibility to each actor.

Furthermore, the Regional Tourism Center of Marrakech serves as a typical example, according to the actors. It brings together representatives of all stakeholders in the tourism sector operating in the Marrakech Safi region on the same floor. The Regional Tourism Center of Marrakech includes hoteliers, travel agents, restaurants, tourist guides, as well as concerned administrations and communities (Wilaya, Prefectures or provinces, Communal Councils, Departments of tourism, handicrafts, culture, etc.). As a result, all actions to be undertaken are widely discussed by all segments of the tourism sector within the CRT office. An annual plan of action is decided, and tasks are assigned to its members based on their specificity and power.

- Identifying collective intelligence

a. The Cognitive dimension

All the professionals interviewed acknowledged the value of a multidisciplinary team in solving complex problems. The team's skills and expertise provide a comprehensive perspective on each issue. Additionally, team spirit fosters inter-comprehension, efficient exchange of ideas, and a common language assimilated by members, leading to complementarity.

Collective intelligence is a concept based on the idea that each member of a community has a part of the best answer to solve a problem. Therefore, collective reflection contributes to the emergence of a common theoretical and practical knowledge within work teams. In the interviews, the term "database" appeared, referring to the collective's ability to take relevant data from the environment to guide their actions.

True collective intelligence is built over time through cooperative methods, including decision-making. However, the professionals interviewed regretted that decision-making remains exclusively solitary. In the Moroccan tourism sector, collective intelligence is still challenging to identify, and its implementation remains complex for the actors interviewed. Nevertheless, they emphasized the importance of collective intelligence, and they aim to promote it in their work.

Furthermore, they rarely share their approaches and thoughts with all the actors, except for coordination meetings or collective actions. In fact, meetings are primarily informative or to raise awareness regarding the practices to be adopted. Due to the pandemic's novelty, most of the actors do not have a clear and practical vision. As a result, the decision-making process is often solitary, with strategic orientations from provincial, regional, or national authorities as the only framework. Additionally, most of the professionals interviewed do not feel involved throughout the process of understanding, reflection, and decision-making, especially when they work on global support projects.

b. The relational dimension

According to the professionals interviewed, collaboration on a common project is necessary to create collective intelligence. They recognize the complementarity of their functions and consider listening, trust, and respect as essential elements for effective collaboration. Collective intelligence and collaborative practices involve combining the efforts and knowledge of each person to achieve a common goal continuously. This process evolves over time and is rooted in a particular group with common character, aspirations, values, and/or interests.

Four elements are crucial for the emergence of collective intelligence and collaborative practices:

- ✓ Autonomous individuals valued for their ability to create meaning.
- ✓ Positive, constant, and shared interaction between group members and their environment (technical, economic, social, environmental, etc.)
- ✓ Dynamic exchanges that evolve in real-time.
- ✓ The presence of complex and unexpected events that trigger knowledge sharing naturally.

However, the lack of coordination and trust within teams hinder collective work. In the tourism sector, actors suggest that management efforts should emphasize building mutual trust between all stakeholders. They acknowledge that the culture of collective work has not yet reached maturity and that each contributor must recognize the value of combining their personal knowledge with that of others. Collaboration is established through a sense of one's limitations and trust in the common sense of others. The moral value of collaboration should be presented as a factor of fulfillment for all contributors, who will be enriched by sharing their knowledge and have pride in succeeding together. This collaboration finds its foundation in a social commitment of the members of the same collective, where each individual contributes with their brain rather than just their hands. Collective intelligence is not just about deciding but also thinking, cooperating, innovating, and creating together.

- Application of collective intelligence in post-COVID tourism

All the professionals interviewed highlighted several weaknesses that were exposed during the COVID-19 crisis, including:

- ✓ Lack of coordination between actors
- ✓ Inadequate alternative devices and tools
- ✓ Absence of legal and technical framework for making local decisions
- ✓ Lack of flexibility in funding to redirect budgets and actions
- ✓ Absence of consultative structures by sector or transversal

Furthermore, they expressed that this crisis presents an opportunity to rethink the tourism sector and rebuild it in a more sustainable, inclusive, and resilient way. However, achieving this goal requires great solidarity and mutual aid between stakeholders. It is also important to target tourism customers who are capable of understanding and managing the situation of COVID, instead of discontinuing travel and leisure activities altogether.

According to the actors interviewed, the challenge today is not so much in finding tools such as brainstorming and co-development to foster collective intelligence, but rather in taking a blank page to reinvent the organization of institutions. This is necessary to establish an ethical framework that enables collective dynamics to flourish.

Intelligence is crucial for creating a sphere of understanding and exchange that reflects the future of tourism and implements sustainable practices across different levels and institutions. To achieve sustainable and resilient tourism, the state must take specific measures. These measures include incorporating collective intelligence into training modules at all levels, establishing a contingency budget, and securing the sector during the planning period of state finances and budgets. Furthermore, implementing laws and a legal framework, reviving old practices of actors and traditional ways of managing and decision-making, capitalizing on experiences, strengthening coordination and communication, and involving all stakeholders in tourism development to make joint decisions and share responsibilities. It may also be necessary to change the management structure of institutions to achieve these goals. With these measures, sustainable and resilient tourism can be achieved and will pave the way for a brighter future in tourism.

3.2. Discussion and Recommendations

Through our discussions with various stakeholders, we have come to understand that collective intelligence is primarily a mindset, rather than just a management or innovation methodology. This mindset is based on three fundamental principles: respect for common rules, development of social ties, and information sharing. The main objective of collective intelligence is to pool the knowledge, skills, and creative capacities of a group of individuals to solve problems and achieve shared goals. To truly harness collective intelligence, it is important to recognize and respect its three dimensions: cognitive, relational, and systemic.

For collective intelligence to emerge, the individuals involved must share a common interest, whether it is a shared objective, identity, or set of experiences or concerns. A horizontal structure must be established that adheres to explicit or implicit rules that are equally applicable to all actors. A clear and dynamic organizational structure, based on voluntary work and complementary skills, is also crucial. Collective management practices must be encouraged, where each member is accountable for their own actions and has recognized autonomy among other actors.

Simply bringing a group of people together is not enough for collective intelligence to be effective. Favorable working conditions must be created through the use of coordination and facilitation tools that enable interaction between individuals. Collaborative spaces and cooperative tools are essential. Information must be shared, circulated, pooled, and capitalized upon. Information tools, such as intranets, collaborative platforms, and social networks, can promote exchanges and real-time communication. These tools allow for regular communication and information transmission between all actors, facilitating the development of collective intelligence. In the tourism sector, in particular, the implementation of these tools can lead to the sharing of best practices, information, and ideas, as well as the creation of chat groups for informal exchanges.

Conclusion

In the current context, collective intelligence has emerged as a solution for the tourism sector to adapt to new rules and survive the impact of the Covid-19 pandemic. The Moroccan tourism industry has faced numerous challenges in the past, but the pandemic has exacerbated these problems and had a significant economic and social impact on its development. This has revealed a lack of adaptation to constraints, poor responsiveness, and a lack of agility in the sector's structure.

The problems mentioned above are rooted in the essence of the tourism sector. The pre-Covid tourism sector lacked coordination between actors, alternative devices and tools, a legal and technical framework for local

decision-making, and flexibility in funding to redirect budgets and actions. In this context, we believe that collective intelligence can help the tourism sector to address these challenges.

We have identified that collective intelligence is multidimensional, involving fostering learning and collective decision-making, building relationships within teams through collaboration, cohesion, and autonomy, and facilitating the contribution of different perspectives. However, we have observed that reflection with all actors is rare, meetings are mainly informative, trust within teams is insufficient, and the culture of collective work has not reached maturity.

Despite these challenges, there are signs of collective intelligence in the tourism sector. Actors in the sector recognize the importance of complementarity and that each member of the community possesses a part of the best answer. Based on our research, we have drawn favorable rules that facilitate the emergence of collective intelligence, including strengthening coordination and communication, involving all stakeholders in the development of tourism, making joint decisions, and sharing responsibilities.

Our qualitative study within tourism establishments has also shown a real need for change in the sector. The upheaval caused by the pandemic has brought new perspectives, and the tourism sector must promote a new model based on horizontal approaches, the creation of a sphere of understanding and exchange, and the establishment of a work environment that includes all stakeholders.

Overall, collective intelligence can help the tourism sector to adapt to the challenges it faces, and the establishment of a culture of collaboration, coordination, and collective work is crucial for the sector's sustainable development.

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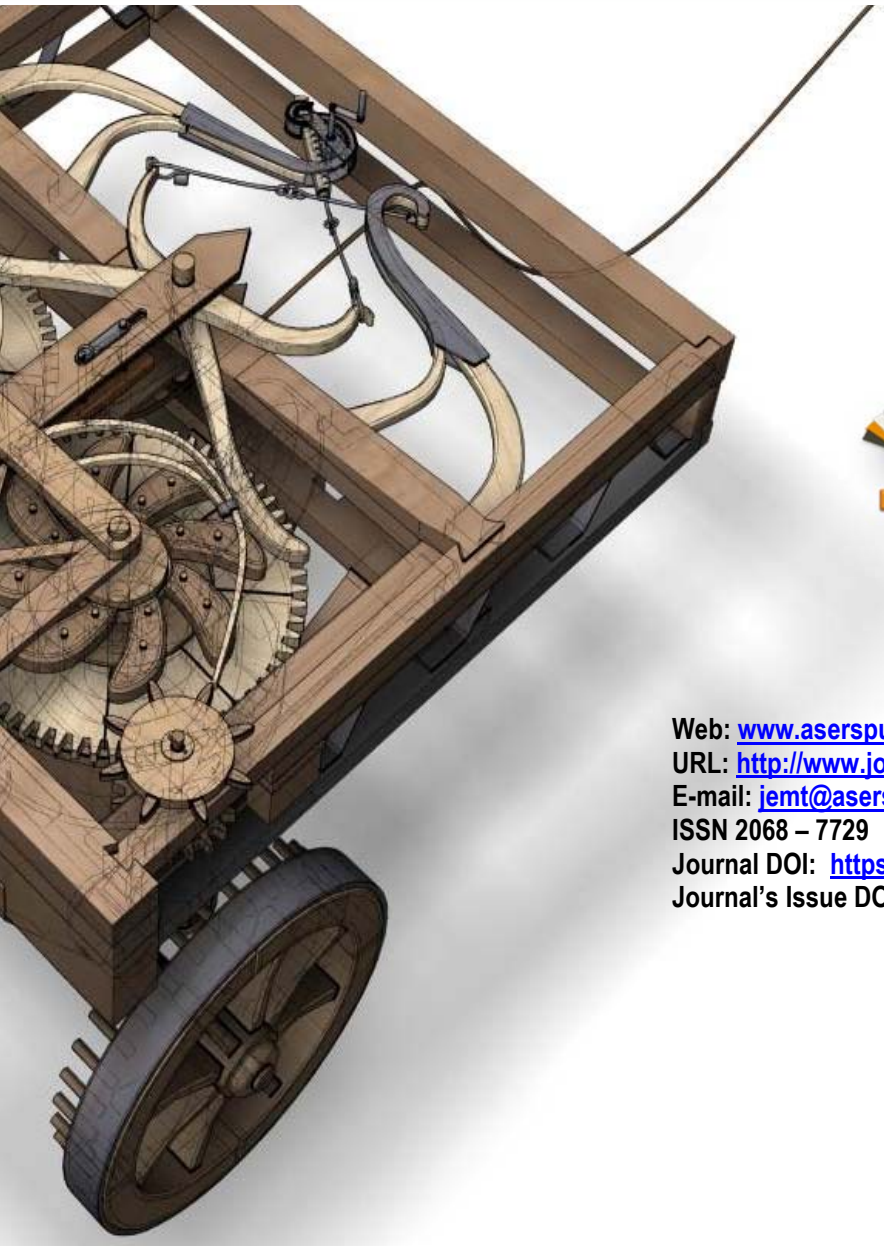

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