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# Assessing Airbnb's Analytics Maturity: A DELTA Framework Analysis

## Introduction

Founded in 2008, Airbnb connects travelers with special accommodations and activities worldwide. This platform has transformed the hospitality industry, allowing users to profit from their homes and passions while encouraging a sense of community. Airbnb's revolutionary business model has eased its expansion into more than 220 countries and regions, consequently providing several million listings worldwide.

This report evaluates Airbnb's analytics maturity using the DELTA framework, focusing on key areas such as Data, Enterprise, Leadership, Targets, and Analysts. The evaluation identifies strengths and areas for improvement within the organization's analytical capabilities.

The report is structured as follows:

1. **Assessment of Airbnb's Analytics Maturity:** An in-depth evaluation of the organization using the DELTA framework.
2. **Proposed Analytics Initiative:** A new analytics project recommendation to enhance Airbnb's analytics maturity.
3. **Application of Themes:** Insights on how the proposed project can further develop Airbnb's analytical capabilities using themes and techniques like the Power-Interest Grid.
4. **Conclusion:** A summary of findings and recommendations.

This analysis aims to provide actionable insights into how Airbnb can further leverage data and analytics to sustain its leadership in the dynamic hospitality sector.

# Evaluation of Airbnb's Analytics Maturity Using the DELTA Framework

## Data

Airbnb gathers extensive information about its users, including preferences, past bookings, and host reviews. Grewal (2019) documents how the company's data science capabilities have evolved significantly since 2012, with advanced tools supporting experimentation, pricing algorithms, search relevance, and user engagement. However, research presented at the DataWorks Summit (2018) reveals that the company has faced challenges with data reliability and scalability, particularly regarding data integration across departments.

Data maturity depends on the breadth, integrity, and quality of data. While Airbnb's global reach generates diverse datasets, concerns about data integrity and quality persist. Deng, Du and Matlin (2022) highlight how the company has worked to improve measurement efficiency through causal surrogacy models, reducing variance in booking metrics by 50-85%. However, incomplete datasets and inconsistent ESG-related metrics continue to obstruct comprehensive enterprise-wide analytics.

Airbnb has strong data collection and analysis capabilities, **scoring 3.5/5**, which helps drive informed decision-making across various functions. However, areas for improvement include enhancing integration across departments, improving data transparency with stakeholders, and expanding focus to ESG-related metrics to align with global sustainability standards.

## Enterprise

Airbnb's core functions benefit from sophisticated analytics implementation. Ye et al. (2018) demonstrate the company's advanced use of analytics in pricing optimization, employing customized regression models that consider unique listing attributes and booking probabilities. These processes help match guests with suitable listings while optimizing host visibility and booking rates.

Chen (2018) describes how Airbnb's machine learning infrastructure has evolved to support standardized workflows and cross-company data sharing, though challenges remain in applying these capabilities to longer-term strategic goals. While the company effectively uses analytics in daily operations, Uyar et al. (2020) note that the hospitality industry as a whole needs improvement in sustainability reporting and metrics.

Airbnb's use of analytics in core functions like pricing and search optimization is solid, **scoring 3/5**. However, to reach a higher level of analytical maturity, the company must foster greater cross-departmental collaboration and integrate analytics into long-term, enterprise-wide initiatives like sustainability and host equity.

## Leadership

Airbnb's leadership has consistently emphasized the importance of data and analytics in strategic decisions. Matteucci (2020) demonstrates how leading hospitality companies can increase corporate value by aligning with sustainable development goals, suggesting a path forward for Airbnb's leadership. The launch of platforms like Minerva, which standardizes metrics across the organization, demonstrates leadership's commitment to fostering a cohesive data strategy.

Alvarez-Risco, Estrada-Merino and Perez-Luyo (2020) indicate that while hospitality businesses are increasingly incorporating Sustainable Development Goals (SDGs) into their operations, significant knowledge gaps remain in achieving desired sustainability outcomes. This suggests an opportunity for Airbnb's leadership to pioneer new approaches to ESG analytics and reporting.

With a strong commitment to data-driven strategies, **Airbnb scores 4/5**, reflected in leadership-driven initiatives like Minerva. While leadership has effectively prioritized analytics, further efforts are needed to expand focus to ESG goals and ensure alignment between analytics and sustainability priorities.

## Targets

Airbnb has clearly defined operational metrics, including booking rates, guest satisfaction, and host retention, all of which are backed by strong analytics. These targets enable the company to remain competitive in the short term by enhancing interactions and services for both guests and hosts. However, while these metrics are important, they mainly concentrate on immediate business results rather than long-term effects.

To achieve sustainable growth, Airbnb should implement what Al-Sai et al. (2022) describe as a comprehensive approach to data maturity assessment. This involves initially exploring critical areas such as local economic impacts and equity among hosts, ensuring that insights derived from data are thorough and actionable. Gove and Uzdinski (2013) argue that performance-based maturity assessments should evaluate both current capabilities and projected effectiveness.

Airbnb sets clear and measurable operational targets, **scoring 3.5/5**, which support short-term success. To sustain long-term growth, Airbnb should set analytics-driven goals that focus on sustainability and equitable resource distribution among hosts.

## Analysts

Airbnb has a talented group of analysts and data scientists who utilize advanced tools like predictive modelling and personalization algorithms (Grewal, 2019). These professionals have spearheaded innovations in crucial areas such as fraud detection, pricing optimization (Ye et al., 2018), and user engagement through sophisticated search ranking systems (Grbovic and Cheng, 2018). While these analysts are highly skilled in their domains, as evidenced by their successful implementation of deep learning solutions (Haldar et al., 2018), there is an increasing demand to broaden their expertise into new fields like ethical AI and sustainability analytics, which are becoming vital in the travel and hospitality sector.

With a skilled analytics workforce, **Airbnb scores 3.5/5**, leveraging advanced tools to drive innovation. To strengthen its analytics capabilities, Airbnb should invest in sustainability-focused upskilling and encourage better cross-team collaboration.

## Overall DELTA Framework Rating

Airbnb excels in analytics, particularly in data collection, leadership commitment, and optimizing its core operations. However, there is still potential for improvement. Issues with data integration and transparency—especially concerning ESG metrics—prevent it from achieving its full capabilities. While leadership emphasizes data-driven decisions, enhancing efforts in sustainability and equity could lead to significant advancements. Improved collaboration across teams and training in ethical AI and sustainability would also be beneficial. Overall, Airbnb rates 3.5/5 in analytics maturity. It's performing well, but with a few strategic enhancements, it could establish new benchmarks in responsible and data-driven decision-making.

# Sustainability Metrics Dashboard: Advancing Airbnb's ESG Goals

## Project Rationale

Airbnb has established itself as a frontrunner in the sharing economy, delivering unique and personalized travel experiences while building connections between hosts and guests. As environmental concerns rise and sustainability becomes increasingly important for travelers, the company has an opportunity to stand out by embedding sustainability into its core operations. The **Sustainability Metrics Dashboard** is designed to give hosts real-time insights into their environmental impact, enabling them to embrace greener practices. By offering clear, data-driven recommendations, Airbnb can motivate hosts to reduce their environmental footprint, attract eco-conscious travelers, and strengthen its image as a responsible travel platform.

The proposed Sustainability Metrics Dashboard aligns with what Rubio-Mozos et al. (2020) describe as essential elements of sustainable strategic management in the hospitality industry. The dashboard's implementation would follow what Matteucci (2020) identifies as best practices for integrating sustainability efforts into brand identity, leading to stronger brand equity and increased customer loyalty.

## Key Performance Indicators (KPIs)

The dashboard will monitor key sustainability metrics to help both hosts and guests make informed choices. It will calculate the **carbon footprint for each stay** by assessing emissions from energy usage, water consumption, and transportation effects, enabling hosts to pinpoint areas for improvement. An **energy efficiency score** will track electricity and gas usage per guest per night, assisting hosts in minimizing unnecessary energy consumption. **Water usage per guest** will be logged to promote conservation efforts, while **waste diversion rates** will show the percentage of waste that is recycled or composted. Furthermore, the dashboard will showcase sustainable property features like solar panels and energy-efficient appliances, aiding guests in selecting eco-friendly accommodations. To boost credibility, Airbnb will incorporate third-party sustainability certifications such as LEED and Green Key, providing verified acknowledgment for environmentally responsible hosts. A **guest sustainability rating** will also be implemented, allowing travelers to assess a property's green initiatives and motivating hosts to improve their sustainability practices.

## Business Benefits of the Sustainability Metrics Dashboard

The Sustainability Metrics Dashboard not only addresses environmental concerns but also brings substantial business advantages for Airbnb (Ozturkoglu, Sari and Saygili, 2020). By establishing itself as a frontrunner in sustainable travel, Airbnb can draw in eco-conscious travellers who are on the lookout for responsible tourism choices (Alvarez-Risco, Estrada-Merino and Perez-Luyo, 2020). This unique positioning can **enhance customer loyalty** and give Airbnb a competitive advantage over rivals.

Furthermore, the dashboard is set to **boost revenue by allowing hosts with strong sustainability credentials to charge higher booking rates and premium prices** (Uyar et al., 2020). Listings that are verified as "green" can be showcased in a special category, increasing their visibility and occupancy rates for hosts committed to sustainable practices.

From a regulatory perspective, this initiative will enable Airbnb to stay ahead of changing sustainability regulations, ensuring compliance with environmental reporting standards in key markets (Hamid, Cheong and Shamsuddin, 2019). Improved ESG transparency will also bolster Airbnb's corporate image, reinforcing its dedication to ethical and sustainable business operations.

Moreover, the dashboard will improve Airbnb's capacity to make informed sustainability decisions at the corporate level. By examining usage patterns and host engagement, the company can refine its broader sustainability strategies, build partnerships with renewable energy suppliers, and work with local governments on green tourism initiatives. Over time, these insights will empower Airbnb to set new benchmarks for sustainability, ensuring its long-term success in a travel market that is increasingly focused on eco-friendliness.

# Leveraging Stakeholder Engagement and Ethical Analytics for Airbnb's Sustainability Goals

## Understanding Stakeholders

For Airbnb's Sustainability Metrics Dashboard to be successful, it's crucial to engage the right stakeholders (Byrd, 2018). This tool aims to assist hosts in measuring and enhancing their environmental impact, but its success depends on widespread adoption throughout the Airbnb ecosystem. **Hosts, guests, Airbnb leadership, regulators, and local communities all have a stake in the initiative's success.**

Hosts, being the primary users, must recognize the tangible benefits of incorporating sustainability metrics into their property management. Offering clear incentives—like increased visibility for eco-friendly listings or financial rewards for lowering energy use—will be vital. Guests are becoming more aware of their environmental impact, so providing them with options to filter and choose sustainable listings will help Airbnb meet the rising demand for responsible tourism (Vrontis et al., 2021).

Airbnb's leadership is essential in prioritizing ESG (Environmental, Social, and Governance) initiatives and ensuring that resources are allocated for the effective implementation of the dashboard. On the regulatory front, governments and environmental agencies will closely examine Airbnb's sustainability efforts, making transparent reporting critical for compliance. Furthermore, local communities can benefit from responsible tourism practices, including reduced waste and energy consumption in short-term rentals.

## Power-Interest Grid

A structured approach to stakeholder engagement can be achieved using the Power-Interest Grid. Airbnb leadership and hosts fall into the "High Power, High Interest" category, requiring active involvement in the design and implementation of the dashboard. Regulators, categorized as "High Power, Low Interest," should receive ongoing updates to ensure compliance without unnecessary intervention. Guests and local communities, while having lower power, hold a high level of interest in sustainability initiatives, making education and awareness campaigns essential for their engagement.

## Stakeholder Communication Plan

To effectively engage with these stakeholders, Airbnb should implement a customized strategy. Hosts would gain from **comprehensive onboarding and training** on utilizing the dashboard, complemented by success stories that illustrate how sustainable practices can boost bookings. Guests should encounter **clear sustainability indicators** while browsing listings, which would encourage eco-friendly decision-making. Airbnb's leadership needs thorough **progress reports** that demonstrate how the dashboard supports corporate ESG objectives. Regulators, on the other hand, require access to **organized sustainability reports** that emphasize Airbnb's contributions to environmental goals.



## Recommendations

A **participatory approach** will boost stakeholder engagement, as demonstrated by successful implementations in other hospitality contexts (Rasoolimanesh et al., 2020). By involving hosts in the co-development of dashboard features, we can ensure they are user-friendly and promote adoption. Providing education and incentives, like **certification badges for sustainable hosts** or discounts for energy-efficient properties, can further encourage participation. Additionally, using **behavioural analytics** will help Airbnb gain insights into guest preferences, enabling the targeted promotion of eco-friendly listings. Lastly, creating **feedback loops** after implementation will allow for ongoing improvements to the dashboard, keeping it relevant and effective.

## Ethical Issues and ESG Concerns

Creating the Sustainability Metrics Dashboard gives Airbnb a chance to take the lead in sustainable tourism. It's essential, however, to approach this ethically, prioritizing fairness, transparency, and accessibility for all involved. Key ethical factors like data privacy, transparency in algorithms, and equitable access should be fundamental to this initiative.

### Addressing ESG Concerns

From an environmental standpoint, the dashboard is designed to lower carbon emissions by equipping hosts with practical insights on energy and water usage, waste management, and sustainable improvements. Predictive analytics could assist hosts in evaluating the effects of sustainability investments, such as the advantages of installing solar panels or transitioning to energy-efficient appliances (Yallop et al., 2020). These insights would facilitate more informed decision-making, aligning Airbnb's business model with global sustainability objectives.

Social factors also need to be considered to ensure that sustainability initiatives do not disproportionately benefit large urban hosts over smaller rural ones. Airbnb should offer customized recommendations that consider various resource limitations, ensuring that all hosts—regardless of their location—can engage in sustainability efforts. Furthermore, Airbnb should provide accessible educational programs to assist hosts in implementing eco-friendly changes. By making sustainability knowledge broadly available, Airbnb can empower hosts at all levels to contribute to environmental goals.

Governance and compliance are equally crucial. The dashboard should conform to international ESG reporting standards, incorporating its data into Airbnb's corporate sustainability reports. Transparent data collection practices will be essential for building trust with regulators, hosts, and guests. Ensuring that sustainability metrics are verifiable and independently audited will enhance the credibility of the initiative and safeguard against greenwashing claims.

Algorithmic fairness must also be prioritized. The methods used to rank and promote sustainable listings should be clearly explained to prevent biases that could disadvantage certain hosts. Airbnb should publish guidelines outlining how sustainability scores are

determined and ensure that these algorithms are regularly assessed for fairness and accuracy. Data privacy is another ethical issue—hosts must retain control over their operational data.

## Recommendations

To maintain ethical standards, Airbnb should take several specific actions. First, it needs to ensure **transparency in its algorithms** by publicly sharing the methodology behind its sustainability rankings. Second, it should implement **measures to protect the privacy of hosts' data**, ensuring that it is used only for sustainability improvements and not for unintended commercial purposes. Third, **prioritizing equity and inclusion** is essential, which could involve providing financial support or incentives for small-scale hosts who are making eco-friendly upgrades. Finally, conducting **regular third-party audits** will help assess the fairness and effectiveness of the dashboard, ensuring it complies with both ethical and regulatory standards.

By proactively addressing these ethical and ESG concerns, Airbnb can establish itself as a leader in sustainable tourism analytics. This initiative will not only improve Airbnb's reputation but also generate real environmental benefits while meeting stakeholder expectations and regulatory requirements.

# Conclusion

Airbnb has made significant progress in incorporating data and analytics into its operations, showcasing a strong commitment from leadership and effective decision-making. Nonetheless, there is still potential for improvement, especially in promoting collaboration across departments and enhancing analytics related to environmental, social, and governance (ESG) factors. The introduction of the Sustainability Metrics Dashboard is a positive move toward establishing Airbnb as a frontrunner in sustainable tourism, enabling hosts to reduce their environmental impact while appealing to eco-conscious travelers. By tackling transparency issues, improving data collection methods, and ensuring the ethical use of AI, Airbnb can foster trust and enhance its competitive position.

Looking forward, Airbnb should prioritize long-term sustainability objectives, integrating ESG factors more thoroughly into its analytics approach. Engaging with stakeholders—including hosts, guests, regulators, and local communities—will be crucial for the success of this initiative. With appropriate investments in technology and ethical analytics, Airbnb could set new benchmarks in the industry and promote a more sustainable, data-driven future for travel.

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# Appendix

This appendix provides supplementary materials that support the analysis and recommendations in the report. It includes an implementation plan for the Sustainability Metrics Dashboard with a flowchart, a Power-Interest Grid to map stakeholder influence, and a Business Ethics Canvas to assess ethical considerations and ESG alignment.

## A. Implementation Plan for the Sustainability Metrics Dashboard

The implementation of the Sustainability Metrics Dashboard will unfold in four main phases, each aimed at ensuring a seamless, user-friendly experience for both hosts and guests, while aligning with Airbnb's sustainability goals.

### Phase 1: Research and Design

The first step involves gathering insights from Airbnb's key stakeholders—hosts, guests, and sustainability experts. Through interviews and surveys, we'll identify which sustainability metrics are most relevant, such as energy use or carbon emissions. Based on these insights, the design team will create a prototype that balances functionality and ease of use, ensuring that the dashboard delivers actionable insights in a simple format.

### Phase 2: Development and Testing

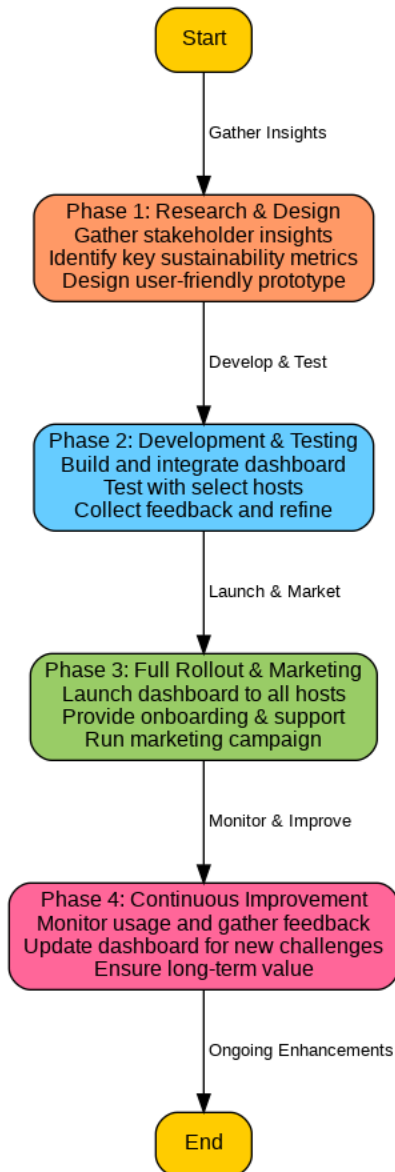
With the design in place, the development team will build and integrate the dashboard into Airbnb's platform. During testing, a smaller group of hosts will use the dashboard to identify any issues and gather feedback. This feedback will allow us to refine the dashboard, ensuring it's both technically robust and user-friendly before launching to all hosts.

### Phase 3: Full Rollout and Marketing

Once the dashboard is ready, it will be launched to all hosts, supported by a marketing campaign that highlights its features. Hosts will receive onboarding materials, including tutorials and customer support, to ensure they can quickly start using the dashboard and see its benefits.

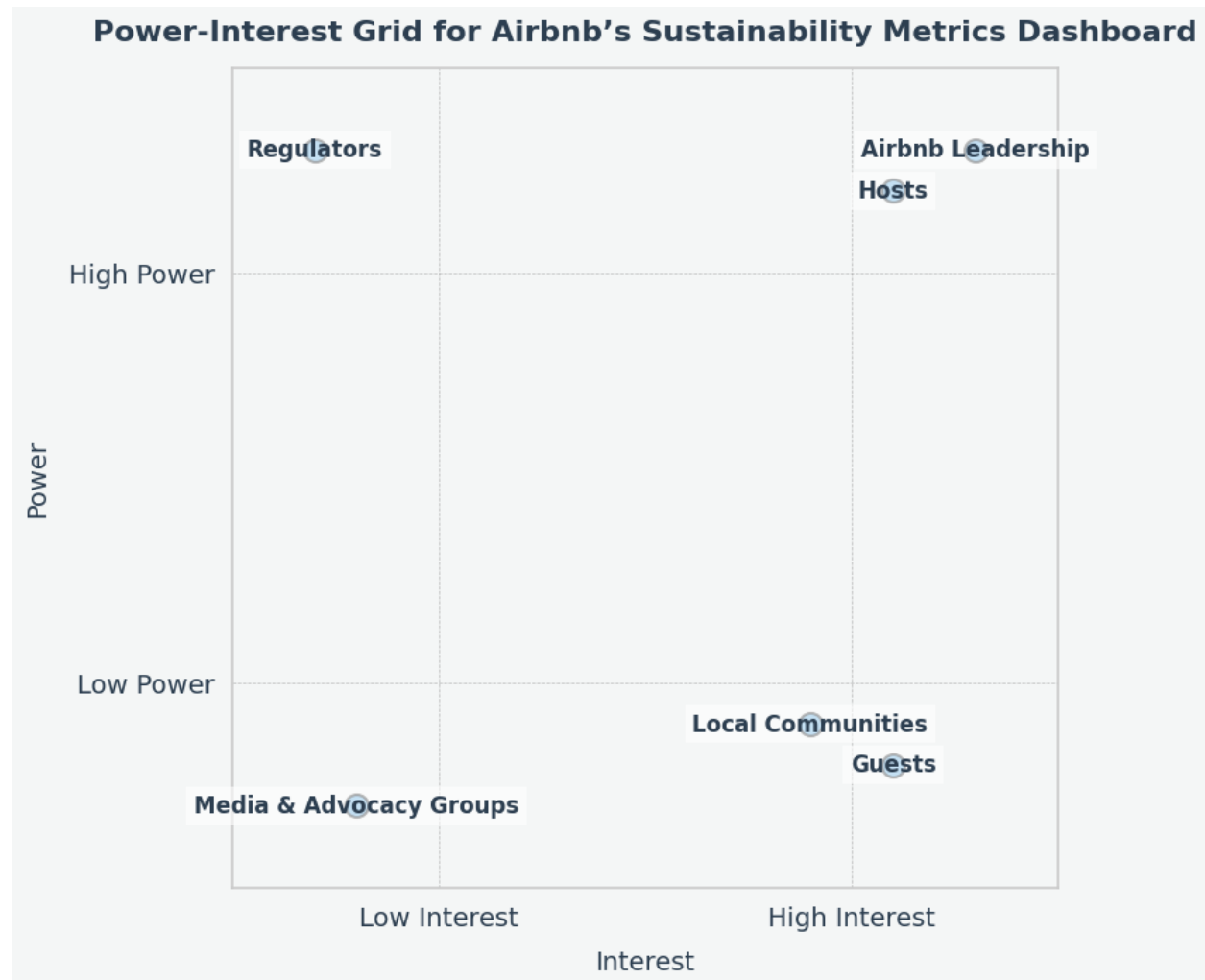
### Phase 4: Continuous Improvement

After launch, we will continuously monitor the dashboard's usage and gather feedback from hosts and guests to identify areas for improvement. Regular updates will ensure that the platform evolves to meet new sustainability challenges and continues to provide value to users.



## B. Power-Interest Grid

The Power-Interest Grid categorizes stakeholders based on their level of power and interest in the Sustainability Metrics Dashboard:





## C. Business Ethics Canvas

The Business Ethics Canvas helps assess ethical considerations related to the Sustainability Metrics Dashboard:

Category	Description
Virtue	Reinforces Airbnb's commitment to sustainability and ethical operations.
Users & Customers	Primary users are Airbnb hosts measuring and improving sustainability efforts.
Solution Ideas	Provides insights into carbon footprint, energy usage, and waste management.
Stakeholders	Key stakeholders: Airbnb hosts, guests, regulators, investors, and local communities.
Utility	Helps hosts reduce costs, attract eco-conscious guests, and contribute to ESG goals.
Common Good	Promotes sustainability across the short-term rental industry.
Justice	Ensures fairness by offering accessible sustainability insights to all hosts.
Rights	Respects hosts' rights by allowing voluntary sustainability tracking.