

Human vs. AI Live Shopping Host : An Empirical Analysis of Performance Dynamics

Jun-yeong Lee¹, Ni-eun Song^{2*}

Abstract

Amidst rapid technological advancements in the live commerce sector, this study aims to comparatively analyze the performance outcomes of AI Live Shopping Host(ALSH) broadcasts versus traditional Human Live Shopping Host(HLSH) broadcasts. Using actual broadcast data from Marado Foods and Nongbuchango on the Naver Shopping Live platform, we quantitatively examine key performance indicators such as payment amount, viewership, peak concurrent viewers, and product views. Independent samples t-test conducted using SPSS revealed that ALSH broadcasts achieved significantly higher payment amounts and purchase conversion rates, while HLSH broadcasts showed relatively higher viewership by indicating that their relative strength in attracting audience engagement. These findings contribute empirical insights to the emerging discourse on AI Live Shopping Hosts, and offers foundational evidence to inform both strategic practice and future academic research. Furthermore, the results underscore the potential benefits of an integrated approach that use both AI and human hosts to optimize performance within live commerce ecosystem.

Keyword : Live commerce, AI Live Shopping Host, Broadcast performance, Purchase conversion rate

1. INTRODUCTION

In recent years, the live commerce market has experienced exponential growth, fueled by the widespread adoption of non-face-to-face consumption trends and advancements in mobile technology. The intrinsic strengths of live commerce - real-time interaction and immediate information dissemination - have profoundly influenced consumer purchasing decisions, firmly establishing its position as a pivotal retail channel. Concurrent with this market expansion, the evolution of artificial intelligence (AI) technology has ushered in transformative changes within the live commerce domain. The emergence of AI Live Shopping Hosts, embodied as virtual humans or AI-driven avatars, has introduced a new competitive dynamic to the traditionally Human Live Shopping Host-dominated market.

AI Live Shopping Hosts offer several compelling advantages including 24-hour broadcasting capabilities, consistent quality assurance, and reduced labor costs so that it makes them an attractive

1 Department of Media Creator, Kyungil University, Gyeongsan, Korea [Professor]
e-mail: ejuneyoung@kiu.ac.kr

2 School of Regional Industry, Kyungil University, Gyeongsan, Korea [Professor]
e-mail: nesong@kiu.ac.kr (Corresponding author)

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alternative for businesses. However, empirical research assessing the actual performance of AI Live Shopping Host broadcasts relative to their human counterparts in real-world market settings remains limited. While the global AI marketing market is projected to grow rapidly in the coming years [1], academic validation of AI Live Shopping Hosts' effectiveness, particularly in live commerce, is notably scarce [2][3].

Existing research has largely examined live commerce effectiveness, focusing on either overall platform performance [4], Human Live Shopping Host attributes and consumer responses [5], or the technical development of AI avatars [6]. In studies on Human Live Shopping Hosts, factors such as host expertise, trustworthiness, and attractiveness have been consistently identified as significant predictors of viewers' purchase intentions [7]. Additionally, real-time interaction and the development of intimacy between hosts and viewers have been emphasized as critical drivers of purchase behavior [8]. In contrast, empirical studies on AI Live Shopping Hosts remain at an early stage [2][3], centering primarily on technological feasibility, user acceptance, anthropomorphism, and perceived sophistication as determinants of consumer attitudes [9]. Notably, despite the increasing adoption of AI Live Shopping Hosts, direct comparative analyses examining commercial performance differences between AI and Human Live Shopping Hosts remain scarce, particularly within the South Korean live commerce market. To address this empirical gap, the present study conducts a performance-based comparison of the two host types using actual sales and engagement data collected from a live commerce platform.

In this regard, this study aims to comparatively analyze the performance of AI Live Shopping Host (ALSH) broadcasts versus Human Live Shopping Host (HLSH) broadcasts by utilizing authentic broadcast data from two prominent companies, Marado foods and Nongbuchango which operate on the Naver Shopping Live platform. Through this comparative analysis, this study intends to explore the current standing and potential of ALSHs in the live commerce market and to derive foundational academic and practical implications vital for developing future ALSH implementation strategies. This study addresses the following research questions (RQs):

- RQ 1: What significant differences, if any, are observed in key performance indicators (payment amount, viewership, peak concurrent viewers, product views, and purchase conversion rate) between ALSH broadcasts and HLSH broadcasts?
- RQ 2: How do situational factors (e.g., product type, broadcast time slot) influence the performance differentials between ALSH and HLSH?

2. LITERATURE REVIEW

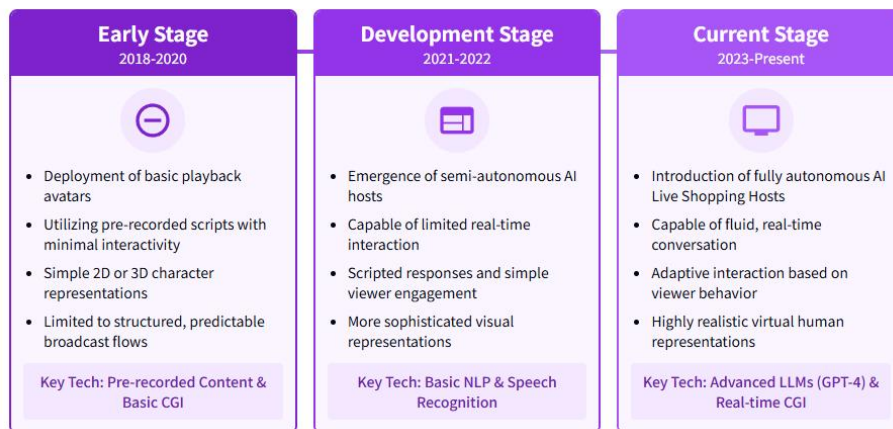
2.1 Live Commerce

Live commerce represents a emerging form of electronic commerce where products are promoted and sold and consumer interaction occurs through real-time video streaming [10]. This format integrates elements of traditional home shopping, social media, and e-commerce, thereby facilitating visual immersion, real-time communication, and bidirectional information exchange. Originating popularized in China, live commerce has rapidly proliferated globally, with the global market size estimated to reach approximately \$270 billion by 2023 [11].

Several key factors drives the success of live commerce including the Live Shopping Host's expertise, charisma, and ability to engage viewers through dynamic real-time interaction. Beyond providing product information, Live Shopping Hosts serve a critical role in building rapport in order to foster trust, and ultimately influence purchase decisions. A Live Shopping Host's professionalism and appeal significantly influence viewer purchase intentions, and the cultivation of social presence through real-time communication acts as a distinctive strength of live commerce [6].

2.2 AI Live Shopping Hosts

2.2.1 Development of AI Live Shopping Hosts



[Fig. 1] Development of AI Live Shopping Host

An ALSH refers to a virtual human or digital avatar that conducts live commerce broadcasts with AI

technology [12-14]. It is also referred to as an AI-powered virtual streamer or virtual anchor. This capability is realized through the integration of computer graphics, natural language processing (NLP), speech synthesis, and deep learning so that AI can mimic or replace HLSHs in delivering product information, interacting with viewers, and driving sales. The evolutionary trajectory of ALSHs can be broadly delineated into three stages as shown in [Fig. 1].

2.2.2 AI Live Shopping Host Types

ALSHs can be classified into several types based on their technical configurations and implementation methodologies. In terms of content generation, some systems rely on pre-recorded materials when they deliver broadcasts using pre-produced scripts and visuals, while others utilize real-time content generation capabilities, dynamically creating broadcast content through AI technologies as the stream progresses. Interaction levels also vary ranging from fully script-based models that adhere strictly to prewritten dialogue to limited interactive systems that allow restricted audience engagement within predefined boundaries, and more advanced autonomous interactive models capable of free-form conversation, often using large language models such as GPT-4. Additionally, the visual representation of ALSH spans multiple formats including 2D avatar types using two-dimensional graphics, 3D virtual human types created through advanced CGI technologies, and highly realistic digital human types that closely replicate human appearance, facial expressions, and voice characteristics. The ALSH analyzed in this study on Naver Shopping Live predominantly exhibit features of real-time generation, limited interactivity, and 3D virtual human representation.

2.2.3 Strengths of AI Live Shopping Hosts

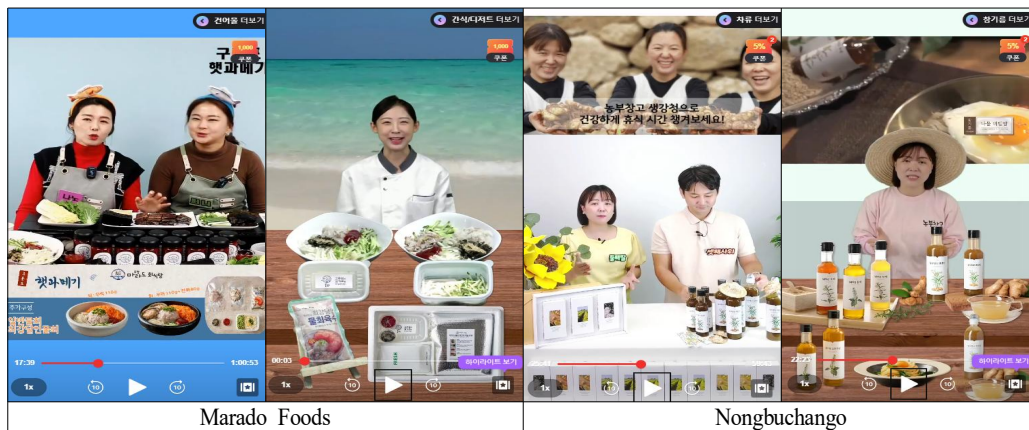
ALSHs offer several distinct advantages that differentiate them from their human counterparts [9]. First, they are capable of uninterrupted 24-hour operation, unconstrained by fatigue or scheduling limitations, thereby enabling continuous broadcasting. Second, AI hosts consistently maintain broadcast quality, as their performance is not affected by physical condition or emotional variability. Third, after the initial development investment, they offer significant cost-efficiency by eliminating ongoing personnel expenses, which can lead to substantial long-term financial savings. In addition, ALSHs possess scalability advantages, allowing them to conduct simultaneous broadcasts across multiple channels and deliver content in various languages. Finally, through the integration of real-time data analytics, AI systems can optimize content delivery and sales strategies dynamically based on viewer interactions and purchasing behavior. However, these strengths are counterbalanced by certain limitations, including difficulties in

establishing emotional empathy with viewers, limited adaptability in unanticipated situations, and potential concerns regarding authenticity, as AI hosts inherently lack direct product usage experience [15].

3. METHODOLOGY

3.1 Data Collection

This study's analysis focuses on live broadcast data collected from two small and medium-sized enterprises, Marado Foods and Nongbuchango, both of which operate on the Naver Shopping Live platform. While both companies had prior experience selling products online, this was their first attempt incorporating AI-powered live shopping hosts into their sales operations. Marado Foods specializes in seafood products to offer sets that combine raw fish and dried seafood with assorted vegetables. Nongbuchango sells cold-pressed sesame and perilla oils as shown in [Fig. 2].



[Fig. 2] Human Shopping Host(Left), AI Shopping Host(Right)

The dataset consists of performance records from a total of 33 live broadcasts conducted between 2023 and November 2024. The Marado Foods account includes 10 HLSH broadcasts and 9 ALSH broadcasts, while the Nongbuchango account consists of 7 HLSH broadcasts and 7 ALSH broadcasts. The dataset incorporates various performance indicators including broadcast type (Human vs. AI), total payment amount per broadcast, total and segmented viewership (logged-in and non-logged-in), peak concurrent viewers, notification settings (total and newly set), product and banner view counts and unique viewers, the number of products sold and unique purchasers, broadcast time details (start time, end time, and total duration), and product type classifications based on the primary products sold.

Furthermore, several derived metrics were calculated for analytical purposes including purchase conversion rate ($\text{Number of Purchasers} \div \text{Total Viewership} \times 100\%$), average payment amount per viewer ($\text{Total Payment Amount} \div \text{Total Viewership}$), and payment amount per unit time ($\text{Total Payment Amount} \div \text{Broadcast Duration in minutes}$).

3.2 Analysis Methods

The collected data were analyzed using SPSS 29.0 to employ the following statistical methods. First, descriptive statistics-including mean, standard deviation, median, minimum, and maximum values-were calculated for major performance indicators across both ALSH and HLSH broadcasts in order to provide an overview of the general distribution and trends. Subsequently, independent samples t-tests were conducted to examine the statistical significance of differences between the two groups. In cases where the assumption of normality was violated, non-parametric Mann-Whitney U tests were applied to ensure the robustness of the comparative analyses.

4. RESULTS

4.1 Human vs. AI Live Shopping Host Performance

[Table 1] presents a comparative overview of the average values for key performance indicators between the HLSH and ALSH broadcast groups, alongside the independent samples t-test results, which confirmed statistically significant differences ($p < 0.05$) between the two groups for several indicators.

[Table 1] Performance Indicators between Human and AI Live Shopping Hosts

Indicator	Human (Mean)	AI (Mean)	Ratio	t-value	p-value
Payment Amount (KRW)	739,754	1,779,188	2.4	3.980	0.000**
Total Viewership (views)	1,049	784	0.7	-1.691	0.101
Logged-in Viewership (views)	786	705	0.9	-0.803	0.428
Non-logged-in Viewership (views)	263	80	0.3	-1.750	0.090
Peak Concurrent Viewers (persons)	32	27	0.9	-1.045	0.304
New Notification Settings (persons)	4	5	1.4	0.732	0.470
Product Views (times)	310	321	1.0	0.206	0.838
Product Viewers (persons)	155	161	1.0	0.291	0.773
Banner Views (times)	2	4	1.5	0.616	0.542
Banner Viewers (persons)	2	3	1.4	0.564	0.577

Number of Products Paid (units)	44	87	2.0	2.666	0.012*
Number of Products Purchasers (persons)	24	51	2.1	3.322	0.002**
Purchase Conversion Rate (%)	2.5	7.3	3.0	3.774	0.001**
Average Payment Amount per Viewer (KRW)	797	2,558	3.2	3.933	0.000**

Ratio = AI Live Shopping Host Broadcast Mean ÷ Human Live Shopping Host Broadcast Mean

*p<0.05, **p<0.01

The independent samples t-test results indicated that the average payment amount for ALSH broadcasts (KRW 1,779,188) was 2.4 times greater than that for HLSH broadcasts (KRW 739,754). This disparity was found to be highly statistically significant ($t=3.980$, $p<0.001$).

Additionally, in terms of purchase conversion rate, ALSH broadcasts (7.3%) exhibited a 3.0 times higher figure than HLSH broadcasts (2.5%), a statistically significant difference ($t=3.774$, $p<0.01$). Similarly, the average payment amount per viewer for ALSH broadcasts (KRW 2,558) was 3.2 times higher than for HLSH broadcasts (KRW 797) ($t=3.933$, $p<0.001$), thereby confirming the sales efficiency of ALSHs.

Lastly, the number of products paid for ALSH broadcasts (87 units) was 2.0 times greater than for HLSH broadcasts (44 units), a statistically significant difference ($t=2.666$, $p<0.05$). Meanwhile, HLSH broadcasts recorded higher values for total viewership, logged-in viewership, non-logged-in viewership, and peak concurrent viewers compared to ALSH broadcasts, but the differences were not statistically significant ($p > 0.05$).

[Table 2] and [Fig. 3] present a comparison of average payment amount between AI and Human Live Shopping Hosts by broadcast time slot, alongside the independent samples t-test results, which confirmed statistically significant differences ($p < 0.05$) between the two groups for several indicators.

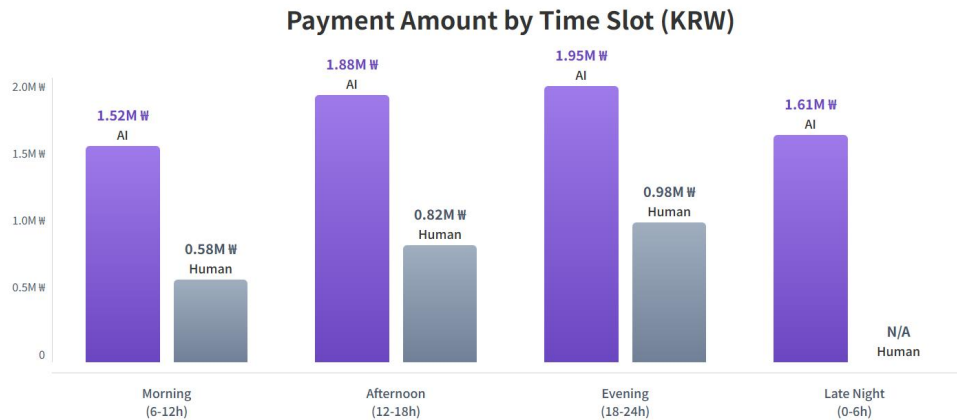
[Table 2] Average Payment Amount by Time Slot for Human and AI Live Shopping Hosts

Time Slot	Human (KRW)	AI (KRW)	Ratio	t-value	p-value
Morning (6-12h)	584,320	1,523,450	2.6	2.492	0.028*
Afternoon (12-18h)	823,570	1,876,730	2.3	2.178	0.039*
Evening (18-24h)	975,630	1,947,640	2	2.087	0.047*
Late Night (0-6h)	N/A	1,605,320	-	-	-

*p<0.05, **p<0.01

Analysis results unequivocally indicate that ALSHs consistently achieved statistically significantly higher payment amounts than HLSHs across all observed time slots. Notably, the most substantial disparity (2.6 times, $t=2.492$, $p<0.05$) was observed during the morning hours. Furthermore, ALSHs

recorded an average payment amount of KRW 1,605,320 even during late-night hours, a period typically unmanaged by HLSHs, thereby empirically substantiating AI's inherent advantage of 24-hour operational capability.



[Fig. 3] Human vs. AI Live Shopping Host Performance

[Table 3] presents a comparison of average payment amount between AI and Human Live Shopping Hosts by product type, alongside the independent samples t-test results, which confirmed statistically significant differences ($p < 0.05$) between the two groups. Furthermore, analysis results demonstrated that ALSHs consistently recorded statistically significantly higher payment amounts than HLSHs across all examined product types.

[Table 3] Average Payment Amount by Product Type for Human and AI Live Shopping Hosts

Product Type	Human (KRW)	AI (KRW)	Ratio	t-value	p-value
Seafood (e.g., Mulhoe, Gwamegi)	687,450	1,943,670	2.8	2.534	0.021*
Food (e.g., Ginger Cheong, Sesame Oil)	823,570	1,732,540	2.1	2.198	0.038*

* $p < 0.05$, ** $p < 0.01$

An additional analysis was conducted to examine how the performance differences between AI and Human Live Shopping Hosts manifested across the two companies (Marado and Nongbuchango).

For the Marado, AI broadcasts exhibited statistically significantly higher average payment amounts compared to human broadcasts ($t=2.632$, $p<0.05$). In terms of the number of products paid, AI broadcasts also registered a significantly higher count than human broadcasts ($t=2.685$, $p<0.05$).

Similarly, the Nongbuchango showed that AI broadcasts yielded statistically significantly higher average payment amounts than human broadcasts ($t=2.180$, $p<0.05$). While AI broadcasts also

outperformed human broadcasts in the number of products paid, this difference did not reach statistical significance ($t=1.856$, $p>0.05$).

4.2 Time Series Trend Analysis

An analysis of the performance trends for HLSHs and ALSHs spanning from 2023 to November 2024 revealed a consistent, gradual improvement in the performance of ALSHs over time. Notably, from the latter half of 2023 onwards, the average payment amount generated by ALSHs exhibited a sustained upward trajectory, further widening the performance gap with HLSHs. This trend can be attributed to the continuous advancements in AI technology coupled with increasing consumer acceptance of ALSHs.

5. Discussion

This study conducted a comparative analysis of the performance of HLSH broadcasts versus ALSH broadcasts, utilizing authentic operational data from Marado Foods and Nongbuchango on the Naver Shopping Live platform. An independent samples t-test performed using SPSS demonstrated that ALSH broadcasts achieved statistically significant superior performance across several key indicators including payment amount, purchase conversion rate, and number of products paid. These findings collectively suggest that ALSHs excel in sales efficiency. On the other hand, HLSHs showed relatively higher viewership, which suggests their strength in drawing audience attention and engagement, even though the differences were not statistically significant. Therefore, combining both AI and Human Live Shopping Hosts in a complementary manner may maximize the strengths of each and enhance overall live commerce performance.

Most importantly, the findings show that ALSHs and HLSHs possess distinct areas of strength. ALSHs achieved higher sales efficiency, whereas HLSHs are more effective in attracting and engaging a wider audience. These results indicate that each type of host can serve different strategic roles within live commerce operations.

6. Conclusion

Amidst rapid technological advancements in the live commerce sector, this study comparatively analyzed the performance outcomes of traditional HLSH broadcasts versus ALSH broadcasts. The results of this study suggest several actionable insights for live commerce operators. First, HLSHs and ALSHs

demonstrate complementary strengths-AI hosts excel in sales efficiency, while human hosts are more effective at audience engagement. Businesses can strategically allocate host types based on marketing objectives, using AI hosts to optimize conversion and sales performance, and human hosts to build customer relationships and expand audience reach.

Second, AI hosts are particularly advantageous for products that require repetitive, consistent information delivery and during time slots with limited human host availability, such as late-night hours, where their 24-hour operational capacity offers additional sales opportunities.

Third, a hybrid operational model that integrates both AI and Human Live Shopping Hosts can help firms balance sales optimization with customer engagement. For example, human hosts may focus on new customer acquisition and brand storytelling, while AI hosts manage ongoing product promotions and support continuous broadcasting across multiple time zones. Such a hybrid approach has the potential to maximize the advantages of each Live Shopping Host type while mitigating their respective limitations.

This study analyzed data from two companies, Marado Foods and Nongbuchango that operate on the Naver Shopping Live platform. As a result, the findings may not be fully generalizable to broader live commerce markets or other platforms. In addition, despite efforts to control for variables such as product types and broadcast time slots, complete elimination of their influence was not feasible. Moreover, the study focused primarily on quantitative performance indicators, which limits understanding of consumer perceptions, satisfaction, and behavioral intentions related to AI Live Shopping Hosts.

In this regard, future studies can be done to expand the scope of analysis by including a more diverse set of companies and platforms to enhance generalizability. In particular, hybrid operational models that integrate AI and Human Live Shopping Hosts is also recommended through experimental designs that identify optimal conditions for each host type. Finally, research focusing on consumer attitudes, satisfaction, and purchasing behavior will help reveal the psychological mechanisms driving the effectiveness of ALSHs.

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