OPEN ACCESS
International Journal of Applied Research in Management and Economics
ISSN 2538-8053

Achieving Sustainable Success in Japan's Mobile Gaming Market: Investigation by Mixed Methods

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ARTICLE INFO

Keywords:
Spending Cessation,
Freemium,
Monetization,
Network Effects,
QCA

ABSTRACT

Japan's mobile gaming market has some of the highest spending levels in the world, yet many apps are terminated early and corporate profits have stagnated. This study examined the conditions for sustainable success at three levels: players, apps, and companies. A mixed-methods design combined factor analysis of spending and spending-cessation motivations based on surveys of Japanese players, fuzzy-set qualitative comparative analysis (fsQCA) of 104 apps and 18 companies, and case studies. High-revenue spending motivations such as character collection correlated positively with the risk of spending cessation, whereas motivations rooted in playing with friends, supporting the operating company, and leisure showed only weak correlations. Avoiding the hyper-casual genre was the only necessary condition for long-term app operation. Counterintuitively, a high app survival rate did not necessarily lead to the profit growth of the company that provided the apps.

1. Introduction

Japan presents a striking paradox in the global mobile gaming industry. Although per-capita spending in Japan is among the highest in the world (Chan, 2021), many of the developers that have historically led the industry have faced severe profit declines over the past decade: The operating profit of GREE, Inc. (now GREE Holdings, Inc.; fiscal years ended June 2015 to June 2024) and that of GungHo Online Entertainment, Inc. (fiscal years ended December 2014 to December 2023) each decreased by approximately 70% (GREE, Inc., 2015, 2024; GungHo Online Entertainment, Inc., 2015, 2024). Why does the world's most lucrative spending market fail to translate into corporate profit growth? This question is the starting point of this study.

Previous research has examined player spending behavior and corporate strategy separately. Some studies have shown a trade-off between monetization and retention in freemium games, whereby enhancing the enjoyment of a service encourages continued use but lowers purchase intention (Hamari et al., 2020). Others have shown that search qualities, such as brand awareness, reviews, and awards, and experience qualities inherent to the game itself determine financial success in markets such as video games (Heidenreich et al., 2023). However, these

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Cite this article as:
Kamizato, K., & Hazra, L. (2026). Achieving Sustainable Success in Japan's Mobile Gaming Market: Investigation by Mixed Methods. *International Journal of Applied Research in Management and Economics, 9*(3): 48-67. https://doi.org/10.33422/ijarme.v9i3.1970

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findings have not been systematically linked to corporate performance, nor examined in the specific context of the Japanese market.

To address this gap, this study adopts a three-level analytical framework spanning players, apps, and companies and sets out three research questions (RQs). RQ1: What is the relationship between the spending motivations and spending-cessation motivations of Japanese players? RQ2: What conditions distinguish mobile game apps (hereafter, apps) that achieve long-term operation of 10 years or more from apps that are terminated within a short period of 2 years or less? RQ3: Why do some Japanese game companies achieve sustained profit growth while the profit growth of other game companies stagnates?

2. Literature Review

Research on freemium monetization has shown that the reasons for purchasing in-game content converge on multiple dimensions, such as unobstructed play, social interaction, competition, and economic rationality (Hamari et al., 2017). In parallel, a paradoxical relationship has been identified: The more enjoyable a service becomes, the stronger the intention to continue using it, but the weaker the intention to make premium purchases (Hamari et al., 2020). However, few studies have quantitatively linked specific spending motivations to specific reasons for stopping spending within a single sample, so the question of which monetization methods increase the risk of spending cessation has not been adequately answered.

Network externality theory (Katz & Shapiro, 1985) holds that utility increases as the number of users grows, a claim supported empirically by findings that player network features substantially improve churn prediction (Óskarsdóttir et al., 2022) and that social systems such as guilds and friend systems contribute to retention (Hwang & Han, 2023). At the company level, the resource-based view (Barney, 1991) suggests that rare and inimitable resources yield sustained competitive advantage, whereas the effects of innovativeness are not uniform: Handrich et al. (2022) found that in the video game industry, innovativeness in presentation and game principles contributes only to short-term success while story innovativeness undermines it, and Choi et al. (2022) showed that the growth effects of innovation strategies depend on firm size and resource configuration. From the perspective of how companies allocate limited resources, a logical tension can be expected between maintaining existing products and investing in new development.

2.1 The Present Study

Taken together, previous research has not answered how spending motivations relate to reasons for stopping spending (RQ1), how essential social elements are to app survival (RQ2), or whether app-level success and company-level profit growth follow the same logic (RQ3). This study addresses these gaps using fuzzy-set qualitative comparative analysis (fsQCA; Ragin, 1987, 2000, 2008), a method suited to identifying multiple equivalent combinations of conditions (equifinality) in medium-sized samples and to comparing the app and company levels.

3. Method

3.1 Research Design and Hypotheses

This study adopted a three-phase mixed-methods design. In Phase 1, surveys were administered to Japanese players who had made in-app purchases in the past and subsequently stopped spending (n = 500 per survey); exploratory factor analysis (EFA) extracted the factor structures

of spending and spending-cessation motivations, and correlation analysis addressed RQ1. In Phase 2, fsQCA was applied to 104 apps and 18 listed Japanese game companies (RQ2 and RQ3). In Phase 3, case studies of six apps and five companies representing the Phase 2 configurations validated and contextualized the quantitative findings.

Five hypotheses (H1–H5) were formulated before the analysis. H1: The strongest driver of spending among Japanese players is the desire to enhance their social status within the game, reflecting the emphasis on others' evaluations in Japan's "shame culture" (Benedict, 1946). H2: Spending motivations and spending-cessation motivations are positively correlated, extending the monetization–retention tension identified by Hamari et al. (2020). H3: Apps that allow players to play with friends are more likely to achieve long-term operation, corresponding to network externality theory (Katz & Shapiro, 1985). H4: Companies with unique strengths succeed in the long term at both the app and company levels, corresponding to the resource-based view (Barney, 1991). H5: Innovative companies likewise succeed at both levels; given mixed prior findings (Choi et al., 2022; Handrich et al., 2022; Na & Kang, 2019), this hypothesis tests whether innovativeness is consistently associated with success in Japan.

3.2 Sample and Data Sources

Player-level data were collected through three survey rounds using an online panel, each with 500 respondents who had made in-app purchases in the past and subsequently stopped spending: one for the factor analysis of spending motivations (60.2% men, 38.8% women, 1.0% other; largest age groups 30s [38.0%] and 40s [33.4%]), one for the factor analysis of spending-cessation motivations (58.4% men, 41.0% women, 0.6% other; 30s [41.0%] and 40s [32.0%]), and one for the correlation analysis between the two sets of motivations (62.2% men, 37.2% women, 0.6% other; 40s [37.6%] and 30s [31.6%]). App-level and company-level data were obtained from the data.ai app analytics service (data.ai, 2025a), which records the release period and operating status at observation but not each app's exact termination date.

Companies were selected from the game-sector listing of Shikiho Online (Toyo Keizai Inc., n.d.), a Japanese corporate information database, and restricted to listed firms that publish investor relations (IR) materials, have been listed for at least 10 years, and whose principal business is smartphone games (or, for diversified firms, disclose smartphone games as a separate segment), yielding 18 companies. Profit growth was assessed from each company's summaries of financial results and annual securities reports, supplemented by the Buffett Code archive (buffett-code Co., Ltd., n.d.) where current disclosures had been removed. Operating profit growth was calculated as the compound annual growth rate (CAGR) from 2014 to 2023: growth rate = $(2023 \text{ value} / 2014 \text{ value})^{1/9} - 1$. Companies with a positive growth rate were classified as successful in profit growth; those with a negative growth rate, or for which the CAGR could not be defined because of an operating loss in 2014 or 2023, were classified as unsuccessful.

The app-level analysis (104 apps) covered apps released by companies in the Shikiho Online game sector. Long-term operational success was defined as release on or before January 31, 2015, and still operating as of January 31, 2025; short-term termination was defined as release on or after January 31, 2023, with termination confirmed by January 31, 2025 (within 2 years of release). This sample was not restricted by the listing-tenure and segment-disclosure filters applied to the 18 companies, which are not essential at the product level. Descriptive statistics of both samples are provided in Appendix B.

3.3 Analytical Procedures

EFA with promax rotation (BellCurve for Excel, Version 4.03; Social Survey Research Information Co., Ltd., 2024) was used to extract the latent factor structures of spending motivations and spending-cessation motivations. To test H2, Pearson correlation analysis (jamovi, Version 2.3.28; The jamovi project, 2023) was conducted between items from a third survey, each written from the EFA results to summarize one extracted factor in a single statement and rating its importance for spending (or for stopping spending) on the game on which the respondent had spent the most, from 1 (not at all important) to 5 (very important).

The factor structures were additionally examined by confirmatory factor analysis (CFA; lavaan, Version 0.7.3; Rosseel, 2012) with robust maximum likelihood estimation.

This study used fsQCA (fs/QCA, Version 4.1; Ragin & Davey, 2022) to identify necessary and sufficient conditions for four outcomes: long-term operational success, short-term termination, profit growth success, and profit growth failure.

For the app-level analysis, six conditions considered to affect long-term operation were selected: whether the app is a role-playing game (RPG); whether it is hyper-casual (HC); whether it has social features; whether the operating company has unique strengths and whether it is innovative; and company size. RPGs are a high-revenue genre that accounts for approximately half of in-app purchase revenue in the Japanese market (Sensor Tower, 2023) but are costly to develop and operate. HC games can be developed in a few weeks to a few months at low cost, but advertising is their main source of revenue, so revenue per user is small (PocketGamer.biz, 2022), and early churn is reported to be common (Kim et al., 2017; PocketGamer.biz, 2022). The RPG and HC classifications followed data.ai (2025a). Social features were assessed by the presence or absence of functions such as cooperative play, competitive play, and real-time chat (archived App Store and Google Play listings; data.ai, 2025a). Genre, social features, and company size were coded as crisp sets (1/0), a special case of fuzzy sets (Ragin, 2008), and unique strengths and innovativeness were calibrated as fuzzy sets.

For the company-level analysis (profit growth), three additional conditions reflecting each company's game portfolio were used in addition to company size, unique strengths, and innovativeness: the RPG ratio (the proportion of RPGs among all operating apps), the HC ratio (the proportion of HC games), and the app survival rate (the proportion of released apps that are still in operation). Company size followed the classification of the Ministry of Health, Labour and Welfare (n.d.), with large enterprises having 1,000 or more employees and SMEs 999 or fewer. A separate category of "small enterprises" with 100 or fewer employees was not used because only one company, with 89 employees (a borderline case), fell into that category.

Innovativeness and unique strengths were derived from ratings by current and former employees on En Kaisha no Hyōban (en Company Reputation), operated by en Japan Inc. (n.d.-c), on the items "challenge to innovation" and "business advantage and uniqueness" (both rated on 5-point scales). Ratings were averaged for each company and calibrated into fuzzy sets using Ragin's (2008) direct method, with full membership at the maximum and full nonmembership at the minimum of each sample and the crossover point at 3.0 (the scale midpoint). The resulting anchors (full membership/crossover/full nonmembership) were 4.3/3.0/2.8 for unique strengths in the app-level sample, 4.0/3.0/2.5 in the company-level sample, and 4.1/3.0/2.6 for innovativeness in both samples. The app survival rate was calculated as the proportion of apps released from 2014 to 2023 that were still operating; the reference dates were January 31, 2025 (apps) and February 8, 2025 (companies). It was calibrated with full membership at 30%, the crossover point at the sample mean of 19%, and full nonmembership at 0%. The company-

level RPG ratio and HC ratio were calibrated with full membership at 30%, the crossover point at 20%, and full nonmembership at 0%.

A consistency threshold of .90 was used to evaluate necessary conditions, and consistency above .80 was required to accept sufficient conditions. Logical remainders were resolved through counterfactual assumptions based on directional expectations specified before the analysis (Ragin, 2008): For long-term operational success, the presence of social features, unique strengths, and innovativeness was assumed to contribute to success; for short-term termination, only the absence of social features was assumed to contribute, because the direction in which company-level attributes affect the termination of individual apps was theoretically ambiguous. At the company level, the presence of unique strengths and innovativeness was assumed to contribute to profit growth success, and their absence to failure. The frequency threshold was 1 because of the small number of cases, and intermediate solutions are reported (the robustness of the results to these decisions is examined in Section 4.4). The case studies triangulated IR reports, press releases, app websites and store listings, and review data (en Japan Inc., n.d.-c).

The robustness of the fsQCA solutions was examined in R (QCA package, Version 3.24; Duşa, 2019; truth tables are in Appendix A). The crossovers of unique strengths and innovativeness were shifted together by ±0.25 or set to the median (3.4); at the app level, the unique-strengths crossover could only be lowered to 2.85 (the lowest rating is 2.8), and its full-membership anchor was also lowered from 4.3 to 4.0. At the company level, the survival-rate crossover was set to the median (15.9%) and the RPG and HC ratio crossovers to 15% and 25%. The sufficiency threshold was set to .75 and .85, the necessity threshold to .85, and the frequency cutoff to 2. Because data.ai does not record termination dates, narrower windows were also examined (short-term termination: apps released within 21 or 18 months of the observation date; long-term operation: apps released at least 11 or 12 years before it).

4. Results

4.1 Player-level Findings: Spending Motivations and Spending-cessation Motivations

The factor analysis extracted five spending motivation factors: Social Status (achieving high rankings, showing off items, maintaining titles, and pursuing superiority; loadings .455–.755), Character Acquisition Desire (collecting, customizing, and anticipating limited-time events offering characters; loadings .525–.897), Game Efficiency Enhancement (shortening leveling time and reducing difficulty; loadings .540–.634), Leisure (stress relief and killing time; loadings .568–.767), Playing with Friends (cooperative or competitive play with friends, loading .408, and sending gifts to friends). In addition, Support Behavior (supporting the operating company) was retained as a single item. Based on the CFA, the item on sending gifts to friends was reassigned from Social Status to Playing with Friends. Mean spending by factor, measured on a 6-point scale (1 = ¥0, 2 = ¥1–999, 3 = ¥1,000–2,999, 4 = ¥3,000–9,999, 5 = ¥10,000–29,999, 6 = ¥30,000 or more), was highest for Character Acquisition Desire (M = 3.29), followed by Game Efficiency Enhancement (M = 2.19) and Social Status (M = 2.06); it was relatively low for Leisure (M = 1.73), Playing with Friends (M = 1.66), and Support Behavior (M = 1.66).

Six spending-cessation motivation factors were extracted: Distrust (encountering bugs, concern about or actual service termination, loss of save data, and game system changes; loadings .583–.710), Satisfaction Without Spending (enjoying the game sufficiently without spending and wanting to play on one's own skill; loadings .433–1.018), Perceived Futility of Spending (a sense that spending has no end and not obtaining the desired outcome;

loadings .591–.606), Futility of Effort (being unable to become a top player and the influence of community and real-life relationships; loadings .433–.675), Fear (concern about dependence and a lack of real-world returns; loadings .587–.699), and Interest Migration (interest in other apps and boredom with the game itself; loadings .438–.657). In addition, Real-Life Fatigue (mental fatigue) was retained as a single item. The loading of 1.018 for Satisfaction Without Spending is an oblique-rotation pattern coefficient. Based on the CFA, one item of Futility of Effort (being unable to clear content easily) was deleted.

CFA of the revised structures showed acceptable fit for the spending motivations (comparative fit index [CFI] = .943, Tucker–Lewis index [TLI] = .918, root mean square error of approximation [RMSEA] = .058, standardized root mean square residual [SRMR] = .047) and moderate fit for the spending-cessation motivations (CFI = .913, TLI = .876, RMSEA = .058, SRMR = .046). CFI and TLI between .90 and .95 can indicate acceptable fit (Brown, 2015, pp. 74–75): The spending-motivation values fell in this range, whereas TLI for the spending-cessation structure fell below .90. RMSEA (.058 in both structures) and SRMR met the cutoffs of .06 and .08, respectively (Hu & Bentler, 1999). In the CFA, Support Behavior and Real-Life Fatigue were entered as single-item observed variables, retained to preserve two distinct motives (spending to support the operating company and ceasing to spend after losing mental leeway). Their interpretation is limited to what the question wording directly captures, and the CFA does not establish their reliability or validity.

The correlation analysis revealed significant positive associations between the importance ratings of the most profitable spending motivations and of specific spending-cessation motivations: Character Acquisition Desire and Perceived Futility of Spending (r = .376, p < .001), Social Status and Futility of Effort (r = .353, p < .001), and Game Efficiency Enhancement and Futility of Effort (r = .314, p < .001; Table 1). In contrast, Playing with Friends, Support Behavior, and Leisure showed only weak correlations (all r ≤ .179).

Table 1. Correlations Between Spending Motivations and Spending-Cessation Motivations

Spending-cessation motivation	Social Status	Character Acquisition Desire	Game Efficiency Enhancement	Leisure	Playing with Friends	Support Behavior
Distrust	.171***	−.031	.169***	.165***	.135**	.131**
Satisfaction Without Spending	.087	.105*	.134**	.137**	.162***	−.053
Perceived Futility of Spending	.099*	.376***	.132**	.120**	.092*	.052
Futility of Effort	.353***	.085	.314***	.156***	.179***	.027
Fear	.189***	−.030	.127**	.151***	.117**	.009
Real-Life Fatigue	.091*	−.023	.072	.157***	.068	.110*
Interest Migration	.098*	.170***	.069	.097*	.033	−.027

Note. N = 500. Each motivation was measured by one item summarizing the corresponding factor (e.g., "raising one's status in the game by winning high rankings or showing off items and titles" for Social Status); the Playing with Friends item asked about playing together with friends and did not cover sending gifts.

*p < .05. **p < .01. ***p < .001.

H1 (that status motivation is the strongest driver of spending) was rejected. The strongest spending motivation was Character Acquisition Desire, which reflects random reward mechanisms, whereas Social Status ranked only third. H2 (that spending motivations and spending-cessation motivations are positively correlated) was partially supported. Although correlations were widespread, only Social Status, Character Acquisition Desire, and Game

Efficiency Enhancement reached a substantive magnitude (r = .314–.376), and the risk of spending cessation was concentrated in spending based on status, character acquisition, and progression.

4.2 App-level Findings: Conditions Enabling Long-term Operation

In the necessary condition analysis, only avoidance of the HC genre met the threshold (consistency = 1.000). For short-term termination, no condition exceeded the threshold (Table 2).

Table 2. App-Level fsQCA: Necessary Condition Analysis (Consistency of Six Conditions)

Condition	Long-term operation: Consistency	Short-term termination: Consistency
RPG	.483	.348
Not RPG	.517	.652
HC	.000	.326
Not HC	**1.000**	.674
Large enterprise	.690	.391
SME	.310	.609
Social features present	.621	.283
Social features absent	.379	.717
Unique strengths present	.758	.662
Unique strengths absent	.242	.338
Innovative	.741	.728
Not innovative	.259	.272

Note. Values in bold meet the .90 threshold. fsQCA = fuzzy-set qualitative comparative analysis; SME = small and medium-sized enterprise; RPG = role-playing game; HC = hyper-casual.

The sufficient condition analysis identified two configurations enabling long-term operation (Table 3; solution coverage = .221, solution consistency = .825) and four configurations leading to short-term termination (Table 4; solution coverage = .247, solution consistency = .979). The first, third, and fourth short-term termination patterns include the absence of social features as an explicit condition. The second pattern does not include social features, indicating that this condition does not affect the outcome in that path.

Table 3. Sufficient Condition Paths to Long-Term Operational Success

Path	Company size	Genre	Social features	Unique strengths	Innovativeness	Raw coverage	Consistency
SME path	SME	RPG	Present	Present	Absent	.052	.910
Large enterprise path	Large enterprise	Neither RPG nor HC	Present	Present	Present	.168	.802

Note. Solution coverage = .221; solution consistency = .825. In the SME path, the absence of innovativeness is included as a condition. SME = small and medium-sized enterprise; RPG = role-playing game; HC = hyper-casual.

Table 4. Sufficient Condition Paths to Short-Term Termination

Path	Company size	Genre	Social features	Unique strengths	Innovativeness	Raw coverage	Consistency
P1	—	HC	Absent	Present	Present	.186	1.000
P2	Large enterprise	HC	—	Present	Present	.020	1.000
P3	SME	RPG	Absent	Absent	Absent	.032	.860
P4	SME	RPG	Absent	Present	Present	.020	.949

Note. Solution coverage = .247; solution consistency = .979. A dash (—) indicates that the condition is irrelevant. SME = small and medium-sized enterprise; RPG = role-playing game; HC = hyper-casual.

4.3 Company-level Findings: The Paradox of Profit Growth and App Survival Rate

In the necessary condition analysis, no condition reached the .90 threshold, and no standalone necessary condition was identified (Table 5). However, "unique strengths present" for success (.842) and "HC ratio not high" for failure (.871) showed relatively high values. Both success and failure in profit growth are thus explained by combinations of conditions rather than by any single condition.

Table 5. Company-Level fsQCA: Necessary Condition Analysis (Consistency of Six Conditions)

Condition	Profit growth success: Consistency	Profit growth failure: Consistency
Large enterprise	.333	.333
SME	.667	.667
High app survival rate	.653	.456
App survival rate not high	.347	.544
High RPG ratio	.687	.628
RPG ratio not high	.313	.372
High HC ratio	.363	.129
HC ratio not high	.637	.871
Unique strengths present	.842	.649
Unique strengths absent	.158	.351
Innovative	.690	.774
Not innovative	.310	.226

Note. fsQCA = fuzzy-set qualitative comparative analysis; SME = small and medium-sized enterprise; RPG = role-playing game; HC = hyper-casual.

In the sufficient condition analysis, only one configuration was identified for profit growth success (Table 6).

Table 6. Sufficient Condition Configuration for Profit Growth Success

Company size	Unique strengths	Innovativeness	App survival rate	RPG ratio	HC ratio	Raw coverage	Consistency
Large enterprise	Present	Present	Low	Low	High	.105	.887

Note. RPG = role-playing game; HC = hyper-casual.

For profit growth failure, four configurations were identified as sufficient conditions (Table 7). The coverage of the failure patterns (46.6%) was markedly higher than that of the success pattern (10.5%), indicating that the conditions for failure were identified more clearly.

Table 7. Sufficient Condition Paths to Profit Growth Failure

Path	Company size	Unique strengths	Innovativeness	App survival rate	RPG ratio	HC ratio	Raw coverage	Consistency
P1	SME	Absent	—	Low	Low	—	.158	.913
P2	SME	—	—	Low	Low	Low	.155	.989
P3	Large enterprise	—	—	High	Low	Low	.144	.989
P4	Large enterprise	—	—	Low	High	Low	.147	.989

Note. Solution coverage = .466; solution consistency = .965. A dash (—) indicates that the condition is irrelevant. SME = small and medium-sized enterprise; RPG = role-playing game; HC = hyper-casual.

4.4 Robustness Checks

The solutions under the variants described in Section 3.3 are summarized in Tables 8 (app level) and 9 (company level).

At the app level, the core results were stable in the calibration, threshold, and cutoff variants of Table 8: Every long-term path combined social features with a non-HC genre, and every short-term path contained the HC genre or the absence of social features, whereas the roles of unique strengths and innovativeness changed with their crossovers and anchors. The non-HC genre remained necessary (consistency = 1.000; Relevance of Necessity [RoN] of the non-HC genre = .326). The narrower windows left the short-term paths largely intact but changed the long-term solutions.

At the company level (Table 9), the success configuration (a single company) recurred whenever the frequency cutoff was 1. Every large-enterprise failure path combined large size with a low HC ratio, and every SME failure path combined small size with a low app survival rate, whereas the other conditions varied. At a cutoff of 2, the success configuration and all SME paths disappeared because they rest on single-company rows. A sufficiency threshold of .75 reproduced the baseline solutions at both levels (Tables 8 and 9), whereas .85 left only the SME path in the app-level long-term solution and changed the company-level failure solution. At a necessity threshold of .85, the necessary conditions were the non-HC genre at the app level (as at .90) and "HC ratio not high" (.871) for failure at the company level; "unique strengths present" (.875) also became necessary for success when its crossover was lowered to 2.75.

Table 8. Robustness of the App-Level fsQCA Solutions

Variant	Long-term: cons./cov.	Paths reproduced	Social + non-HC in all paths	Short-term: cons./cov.	Paths reproduced	HC or no social in all paths
Calibration, threshold, and cutoff variants						
Baseline (as reported)	.825/.221	All	Yes	.979/.247	All	Yes
Crossovers lowered: 2.85/2.75	.826/.225	All	Yes	.983/.266	All	Yes
Crossovers raised: 3.25/3.25	.881/.169	None; new: bRhFs, BrhFs, bRhFi	Yes	.971/.236	P2; new: bRhfs, brHfsI	Yes
Crossovers at the median: 3.4/3.4	.856/.201	None; new: BrhFi, bRhFi, brhFsI	Yes	.965/.255	P2; new: bRhfs, brHfsi	Yes

Variant	Long-term: cons./cov.	Paths reproduced	Social + non-HC in all paths	Short-term: cons./cov.	Paths reproduced	HC or no social in all paths
Unique-strengths full-membership anchor = 4.0	.913/.054	SME	Yes	.985/.260	All	Yes
Sufficiency threshold = .75	.825/.221	All	Yes	.979/.247	All	Yes
Sufficiency threshold = .85	.910/.052	SME	Yes	.979/.247	All	Yes
Frequency cutoff = 2	.825/.221	All	Yes	1.000/.186	None; new: brHfSI	Yes
Window variants						
Short-term window ≤ 21 months (*n* = 20)	.871/.672	None; new: BhSI, hFSI, bRhSi	No	.962/.302	All	Yes
Short-term window ≤ 18 months (*n* = 11)	.952/.674	None; new: bRhS, BhSI, hFSI	No	1.000/.360	P1, P2	Yes
Long-term window ≥ 11 years (*n* = 42)	.859/.044	SME	Yes	.979/.247	All	Yes
Long-term window ≥ 12 years (*n* = 20)	No solution	—	—	—	—	—

Note. cons./cov. = solution consistency/coverage; reproduced baseline paths: Large, SME (Table 3), P1–P4 (Table 4); new = other paths (uppercase = present, lowercase = absent; B large enterprise, R RPG, H HC, F social features, S unique strengths, I innovativeness). n = cases of the redefined outcome. Yes/No = condition holds in all paths.

Table 9. Robustness of the Company-Level fsQCA Solutions

Variant	Success: cons./cov.	Reproduced	Failure: cons./cov.	Paths reproduced	Large: low HC in all	SME: low survival in all
Baseline (as reported)	.887/.105	Yes	.965/.466	All	Yes	Yes
Crossovers lowered: 2.75/2.75	.887/.105	Yes	.992/.433	P2, P3, P4	Yes	Yes
Crossovers raised: 3.25/3.25	.887/.105	Yes	.930/.551	P3, P4; new: bsIvh, bivrh, bsvh	Yes	Yes
Crossovers at the median: 3.4/3.4	.887/.105	Yes	.989/.293	P3; new: bsvrh	Yes	Yes
Survival-rate crossover at the median	.864/.085	Yes	.968/.450	All	Yes	Yes
RPG/HC crossover = 15%	.887/.105	Yes	.964/.463	All	Yes	Yes
RPG/HC crossover = 25%	.900/.105	Yes	.996/.458	P2, P3, P4	Yes	Yes
Sufficiency threshold = .75	.887/.105	Yes	.965/.466	All	Yes	Yes
Sufficiency threshold = .85	.887/.105	Yes	.992/.433	P2, P3, P4	Yes	Yes
Frequency cutoff = 2	No solution	—	.994/.278	P3, P4	Yes	None

Note. P1–P4: reproduced paths of Table 7; new = other paths (uppercase = high, lowercase = low; letters as in Table 8, plus V = app survival rate, with B, S, I, R, H as there). Yes/No = condition holds in all large-enterprise (SME) paths; None = no SME path.

4.5 Evaluation of the Hypotheses on Apps and Companies

H3 (that elements allowing players to play with friends increase the likelihood of long-term operation) was partially supported. Social features alone did not reach the necessary condition threshold (consistency = .621), but they were included in both long-term configurations (Table 3) and in every long-term configuration across the calibration, threshold, and cutoff variants (Table 8), and their absence was a condition in three of the four short-term termination patterns (Table 4), consistent with the player-level finding that the Playing with Friends motivation was barely correlated with spending cessation (r = .033–.179).

H4 and H5 (unique strengths and innovativeness) received only tentative support. Neither reached the necessary condition threshold (Tables 2 and 5). "Unique strengths present" appeared in both long-term configurations and in the only success configuration (Table 6), and innovativeness as "not innovative" in the SME path; both also appeared in short-term termination patterns (P1, P2, and P4 in Table 4). Only P1 of the failure paths (Table 7) included the absence of unique strengths, and innovativeness was irrelevant in all four. Both roles changed with their crossover points (Tables 8 and 9).

4.6 Contextualizing the Findings through Case Studies

In Phase 3, 11 case studies were conducted, one for each pattern identified by fsQCA (two long-term operational successes, four short-term terminations, one profit growth success, and four profit growth failures). The classifications below are based on this study's indicators, including review-based ratings, and are not overall evaluations of the companies.

4.6.1 App-Level Case Studies

A representative case of the SME path is *Ken to Mahō no Logres: Inishie no Megami* (Sword and Magic Logres: The Ancient Goddess) by Marvelous Inc. (hereafter, Marvelous), released in 2013 and still operating after approximately 12 years (Aiming Inc. & Marvelous Inc., n.d.). Marvelous is classified as high in unique strengths and low in innovativeness (en Japan Inc., n.d.-i). Its unique strengths lie in multiple long-running intellectual properties rooted in console game development (Marvelous Inc., n.d.), and its low innovativeness is reflected in a conservative stance toward the game itself: The app has kept its clan-centered cooperative-play design without major changes (Aiming Inc. & Marvelous Inc., n.d.), retaining existing players through interdependence and avoiding the risk of major overhauls.

A representative case of the large enterprise path is the mobile version of *Jikkyō Powerful Pro Yakyū* (Powerful Pro Baseball) by Konami Digital Entertainment Co., Ltd. (hereafter, Konami), classified as high in both unique strengths and innovativeness (en Japan Inc., n.d.-h; ratings for the parent company, KONAMI GROUP CORPORATION). Its unique strength lies in the established console series, whose popular character-development mode it brought to mobile in December 2014, and its innovativeness is reflected in the continual addition of new modes (Konami Digital Entertainment Co., Ltd., n.d., 2021); the app has thus operated for more than 10 years, maintaining existing players' interest while attracting new ones.

The four short-term termination cases each corresponded to an fsQCA pattern. A typical HC termination is *Miracle Girl no Nitaku Game* (Miracle Girl's Two-Choice Game) by TokyoTsushin, Inc. (now Tokyo Communications Group, Inc.; data.ai, 2025b), a company specializing in low-cost, short-cycle development of free, advertising-supported casual and HC games (Tokyo Communications Group, Inc., n.d.) and rated high in both unique strengths and innovativeness (en Japan Inc., n.d.-j). *Screw Sort Puzzle* by CyberAgent, Inc. (hereafter, CyberAgent) belongs to a similar high-volume portfolio: Its subsidiary GOODROID, Inc. (hereafter, GOODROID) has maintained, since its founding in 2014, a policy of three new apps

per month (gamebiz, Inc., 2014; CyberAgent, Inc., 2024). The former had no social features, and the latter's social feature was limited to a ranking (data.ai, 2025b, 2025c). For such companies, early termination of individual apps is better regarded not as a failure but as part of a portfolio model that screens out unpromising apps early (CyberAgent, Inc., 2024), and deep social features are incompatible with low-cost, short-cycle development.

Among the RPG termination cases, *BLACK STELLA PTOLOMEA* by CyberStep, Inc. (hereafter, CyberStep) and *ASTER TATARIqUS* by gumi Inc. (hereafter, gumi) are instructive. Both were SME-operated RPGs with absent or limited social features, but CyberStep met neither the unique strengths nor the innovativeness condition and gumi met both (en Japan Inc., n.d.-b, n.d.-e); the former centered on a rich story and turn-based battles (CyberStep, Inc., 2024). The latter deliberately omitted social features (4Gamer.net, 2023), added cooperative Guild Raid content in May 2024 (gumi Inc., 2024b), and nonetheless ended service that September (gumi Inc., 2024a), illustrating that adding social features after the fact is not sufficient without other supporting conditions.

4.6.2 Company-Level Case Studies

CyberAgent, the case of profit growth success, combines large-scale RPGs by its subsidiary Cygames, Inc. with mass-produced HC apps by GOODROID and is rated high in both unique strengths and innovativeness (en Japan Inc., n.d.-a), and its RPG ratio is low and its HC ratio high (data.ai, 2025a). Under this dual-axis strategy, the operating profit of its game business increased by approximately 160% from 2014 to 2023 (CyberAgent, Inc., 2014, 2023). GOODROID has developed more than 100 apps, the most of any subsidiary in the group, through a flow that screens out unpromising apps early: After 3 days to 1 week of planning and test development, an acquisition test measures cost per acquisition through actual ad placement, and only apps that pass proceed to full development (CyberAgent, Inc., 2024). The company's app survival rate, calculated from data.ai data rather than disclosed by the company (data.ai, 2025a), is considered to reflect this flow.

There were four cases of profit growth failure. KLab Inc. (hereafter, KLab) and Voltage Inc. (hereafter, Voltage) were both SMEs with a low RPG ratio and a low app survival rate. Their genres, idol-training and romance simulations, are neither as profitable as RPGs nor as inexpensive to develop as HC games; it is considered that many titles were terminated within a short period and that the accumulated losses exceeded revenues. KLab is classified as a company without unique strengths (en Japan Inc., n.d.-g) and corresponds to P1 in Table 7; Voltage, which also had a low HC ratio, corresponds to P2 regardless of its rating on unique strengths (en Japan Inc., n.d.-k). Over the 10 years, both moved from an operating profit to an operating loss (KLab Inc., 2015, 2024; Voltage Inc., 2015, 2024).

GungHo Online Entertainment, Inc. (hereafter, GungHo) and GREE, Inc. (hereafter, GREE) are both large enterprises with opposite app survival rates. GungHo tilted its portfolio toward development-intensive RPGs with a low app survival rate, corresponding to P4 in Table 7, and GREE had a high app survival rate with both a low RPG ratio and a low HC ratio, corresponding to P3; both are classified as high in unique strengths and innovativeness (en Japan Inc., n.d.-d, n.d.-f). Nevertheless, the operating profit of both decreased by approximately 70% over the same 10 years (GREE, Inc., 2015, 2024; GungHo Online Entertainment, Inc., 2015, 2024), showing that a high app survival rate does not translate directly into profit growth.

These cases suggest that the issue is not the level of the app survival rate itself but its fit with the development cost level of the genre: CyberAgent tolerated a low survival rate in low-cost HC games, whereas GungHo had the same structure in high-cost RPGs, and Voltage and KLab in genres that are neither high-revenue RPGs nor predominantly low-cost HC games. GREE

shows that even a company with high unique strengths and innovativeness does not achieve profit growth if its existing strengths lose their effectiveness as the market changes.

5. Discussion

The central contribution of this study is empirical evidence that app-level success and company-level success are governed by different, and at times conflicting, logics. This evidence provides a configurational demonstration, based on corporate financial data and app survival data from Japan's mobile gaming market, of the structural tension between maintaining existing products and reallocating resources to new apps.

This divergence has direct practical implications. For large enterprises, a low app survival rate should not be read as a sign of weak execution: The CyberAgent case shows that deliberately and swiftly terminating underperforming apps and reinvesting in successful ones can be a coherent, effective strategy rather than a sign of failure. This redefines short-term termination as a strategic choice rather than a negative outcome and bears directly on how analysts and investors should interpret the app survival rate as a metric.

The appearance of social features in the long-term operation patterns of both company size categories (and in every long-term path across the calibration, threshold, and cutoff variants in Section 4.4)—although social features alone did not meet the consistency threshold for a necessary condition—further supports network externality theory (Katz & Shapiro, 1985) in this market. This is reinforced by the player-level finding that the Playing with Friends spending motivation was one of the factors weakly associated with spending cessation (r = .033–.179): Unlike the high-revenue motivations linked to an elevated risk of spending cessation, spending rooted in playing with friends appears to carry little cost in terms of continued spending, converging with the app-level evidence on the value of social features. Together, these results also highlight a methodological point: Because fsQCA analyzes necessary and sufficient conditions separately, it avoids conflating a condition being common to some cases with that condition being indispensable for success. The only condition confirmed as necessary was the non-HC genre, which remained necessary under every calibration: None of the 15 HC apps remained in long-term operation. However, because 89 of the 104 apps were non-HC, avoiding the HC genre alone does not ensure long-term operation (RoN of the non-HC genre = .326), and other conditions, such as social features, were also involved.

The strategic divergence by company size is substantive rather than simply a matter of economies of scale, though it was not demonstrated symmetrically for the two categories. A profit growth success configuration was identified only for large enterprises: A configuration with unique strengths, innovativeness, a high HC ratio, and both a low RPG ratio and a low app survival rate was associated with profit growth (Table 6), although the contributions of unique strengths and innovativeness are tentative because they changed with their crossover points (Section 4.4), and the CyberAgent case study confirmed that this configuration corresponds to terminating underperforming apps early and shifting resources to promising ones. Consistently with this, every large-enterprise failure path in Table 7 combined large size with a low HC ratio in all nine rows of Table 9.

For SMEs, by contrast, only two failure paths were identified, and no success configuration emerged. The two SME failure paths recurred in only some of the calibration variants (P1 in three and P2 in six of the nine company-level rows of Table 9, including the baseline), but a low app survival rate was common to every SME failure path in the eight rows with a frequency cutoff of 1, whereas the accompanying conditions varied. The other conditions should therefore be regarded as tentative, but a low app survival rate may be the central condition of failure for

SMEs. Implications derived from one company size category should not be assumed to apply to the other.

The player-level findings add another layer: The positive association between the most profitable spending motivations and the risk of spending cessation suggests that Japan's freemium model may be facing a structural ceiling, consistent with Ascarza et al. (2025), who noted that optimizing monetization requires careful calibration. Together with the app-level finding that social features appear in the long-term operation patterns, sustainable monetization design may depend on balancing high-revenue, mechanisms with a high risk of spending cessation with mechanisms that foster social connection, such as teams, cooperative play, and friend systems.

As for generalizability, the mechanisms identified are likely to apply beyond the present samples. The benefit of social features for retention may also hold in other countries, because it arises from network externalities (Katz & Shapiro, 1985): Through network effects, the value of an app to a player rises as more friends play it, regardless of the market. Likewise, the low app survival rate common to the SME failure paths may also be harmful for unlisted developers and independent studios, because they face the same resource constraints: With little capital to absorb the development costs of apps that are terminated early, a low survival rate is likely to translate directly into accumulated losses.

Viewed across the three levels, the findings do not converge on a single, unified formula for success: Sustainability at the player level favors restraint in competitive spending, sustainability at the app level favors non-HC genres and social features, and profitability at the company level depends on a logic of app deployment that differs by company size. This layered picture is itself a finding—the conditions for success in Japan's mobile gaming market cannot be adequately captured at any single level of analysis.

6. Conclusion

This study identified the conditions for sustainable success in Japan's mobile gaming market across three levels: players, apps, and companies. For a market with among the highest per-capita spending in the world yet little academic attention, it demonstrates (a) an interaction between spending and spending-cessation motivations suggesting an optimal level of monetization in the freemium model; (b) empirical evidence that app-level success and company-level profit growth can diverge; (c) evidence from multiple methods that elements allowing players to play with friends are associated with long-term operation, supporting network externality theory (Katz & Shapiro, 1985) in this market; and (d) evidence that the conditions for profit growth differ by company size, with a success configuration identified only for large enterprises.

Practically, large enterprises should concentrate resources by operating many apps in parallel, centered on HC apps, and terminating underperformers early, without treating the app survival rate as an unconditional indicator of success; for SMEs, only two failure paths were identified, they shared a low app survival rate, which may be the central condition of failure, whereas the accompanying conditions varied across calibrations; and companies of all sizes may benefit from building elements that allow play with friends into their designs from the earliest stages of development. The results were relatively stable across calibration anchors and thresholds but sensitive to the observation windows and comparison sets.

7. Limitations and Future Research

The limitations of this study include its focus on the Japanese market, and the moderate fit of

the structure of spending-cessation motivations together with the use of the same samples for the EFA and CFA. Support Behavior and Real-Life Fatigue were measured with single items, so their reliability and validity could not be examined, and results involving them should be interpreted with caution. The correlation analysis used one summary item per factor, whose reliability could not be assessed; future research should test it by administering the multi-item scales and the summary items to the same respondents. In addition, the solution coverage for profit growth success was low (10.5%), so its explanatory scope is limited.

The employee review ratings used for unique strengths and innovativeness may be affected by reviewer bias and differences between current and former employees. External indicators such as patents, awards, partnerships, and monthly active users (MAU) were considered but not adopted because they could not be compared across firms; valid, comparable objective indicators are needed.

Because data.ai does not provide termination dates, survival analysis was not possible, and the actual lifespans of short-term apps (when within 2 years they were terminated) could not be distinguished; the company-level survival rate also reflects only operating status at the observation date. Future research should replicate these analyses in other markets and firm types.

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Appendix A

Truth Tables for the fsQCA Analyses

Table A1. Truth Table for the App-Level Analysis (104 Apps)

Size	RPG	HC	Social features	Unique strengths	Innova-tiveness	n	Long-term consistency	Long-term outcome	Short-term consistency	Short-term outcome
0	0	0	0	0	1	2	.303	0	.697	0
0	0	0	0	1	1	9	.422	0	.578	0
0	0	0	1	1	0	1	.722	0	.278	0
0	0	0	1	1	1	5	.686	0	.314	0
0	0	1	0	1	1	14	.000	0	1.000	1
0	1	0	0	0	0	1	.140	0	.860	1
0	1	0	0	1	0	2	.507	0	.493	0
0	1	0	0	1	1	1	.051	0	.949	1
0	1	0	1	1	0	3	.910	1	.090	0
0	1	0	1	1	1	7	.703	0	.297	0
1	0	0	0	1	1	11	.734	0	.266	0
1	0	0	1	1	1	16	.802	1	.198	0
1	0	1	1	1	1	1	.000	0	1.000	1
1	1	0	0	1	1	15	.608	0	.392	0
1	1	0	1	1	1	15	.665	0	.335	0

Note. 1 = membership above .5; 0 = otherwise. One app with exactly .5 is in no row.

Table A2. Truth Table for the Company-Level Analysis (18 Companies)

Size	Unique strengths	Innova-tiveness	Survival rate	RPG ratio	HC ratio	n	Companies	Success consistency	Success outcome	Failure consistency	Failure outcome
0	0	1	0	0	0	1	Alt Plus	.014	0	.986	1
0	0	1	0	0	1	1	KLab	.194	0	.806	1
0	1	0	0	1	0	1	Mynet	.426	0	.574	0
0	1	1	0	0	0	1	Voltage	.021	0	.979	1
0	1	1	0	1	0	4	gumi, Aiming, Drecom, Ateam	.265	0	.735	0
0	1	1	1	0	1	1	Akatsuki	.682	0	.318	0
0	1	1	1	1	0	2	enish, Mobile Factory	.339	0	.661	0
1	1	1	0	0	1	1	CyberAgent	.887	1	.113	0
1	1	1	0	1	0	2	GungHo, COLOPL	.012	0	.988	1

Size	Unique strengths	Innova-tiveness	Survival rate	RPG ratio	HC ratio	n	Companies	Success consistency	Success outcome	Failure consistency	Failure outcome
1	1	1	1	0	0	2	MIXI, GREE	.012	0	.988	1
1	1	1	1	1	0	1	Square Enix	.562	0	.438	0

Note. 1 = membership above .5; 0 = otherwise. CAVE (exactly .5) is in no row.

Appendix B

Descriptive Statistics

Table B1. Descriptive Statistics of the App Sample

Variable	Long-term operation (*n* = 58)	Short-term termination (*n* = 46)	Total (*N* = 104)
RPG	28 (48.3%)	16 (34.8%)	44 (42.3%)
Hyper-casual	0 (0.0%)	15 (32.6%)	15 (14.4%)
Large enterprise	40 (69.0%)	18 (39.1%)	58 (55.8%)
Social features present	36 (62.1%)	13 (28.3%)	49 (47.1%)
Operating company's unique strengths rating, M (SD)	3.55 (0.30)	3.37 (0.29)	3.47 (0.30)
Operating company's innovativeness rating, M (SD)	3.49 (0.37)	3.43 (0.30)	3.46 (0.34)

Note. Cells show n (%) unless otherwise indicated. Ratings are 5-point-scale averages for the operating company of each app. RPG = role-playing game.

Table B2. Descriptive Statistics of the Company Sample (N = 18)

Variable	M	SD	Min	Max
App survival rate (%)	19.1	10.8	0.0	40.3
RPG ratio (%)	36.4	29.5	0.0	90.9
HC ratio (%)	7.6	15.8	0.0	58.8
Unique strengths rating	3.38	0.35	2.50	4.00
Innovativeness rating	3.49	0.37	2.60	4.10

Note. 6 of the 18 companies were large enterprises (1,000 or more employees), and 6 achieved profit growth. SD = standard deviation; RPG = role-playing game; HC = hyper-casual.