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INTEGRATED MANAGEMENT OF ESPORTS CLUB SYSTEMS: DATA ROUTING AND JOINT OPERATION

ІНТЕГРОВАНЕ УПРАВЛІННЯ КЛУБНИМИ СИСТЕМАМИ КІБЕРСПОРТУ: МАРШРУТИЗАЦІЯ ДАНИХ ТА СПІЛЬНЕ ФУНКЦІОНУВАННЯ

Hrabar Maryna

PhD in Economics, Associate Professor of the Department of Tourism,
State University "Uzhhorod National University"
ORCID: <https://orcid.org/0000-0002-2753-4462>

Грабар Марина

Державний вищий навчальний заклад
"Ужгородський національний університет"

Esports, as one of the most dynamic segments of the modern entertainment industry, requires not only high player skill but also effective organization and management of all internal processes. This need has been shaped by the growth in the number of esports clubs, tournaments, and leagues, leading to the necessity of implementing complex data management systems and altering approaches to ensure the seamless interaction of all infrastructure components. Thus, this article aims to provide a systematic characterization of the impact of routing processes and the collaborative functioning of clubs on the quality of integrated management of their operations. The research results have demonstrated that routing processes and collaborative functioning within the integrated management of esports club systems lead to increased efficiency, reduced costs, improved decision-making, higher employee and customer satisfaction, and enhanced club competitiveness.

Keywords: esports clubs, esports, complex systems, club networks, comprehensive approach, optimization of management processes.

Кіберспорт, як один з найдинамічніших сегментів сучасної індустрії розваг, вимагає не лише високої майстерності гравців, а й ефективної організації та управління для всіх внутрішніх процесів. Окреслена потреба виникла через зростання кількості кіберспортивних клубів, турнірів та ліг, що призводить до необхідності впровадження складних систем управління даними (внаслідок лавиноподібного зростання обсягів інформації, яку необхідно збирати, обробляти та аналізувати) та зміни підходів до забезпечення безперебійної взаємодії всіх компонентів інфраструктури (внаслідок постійного вдосконалення інфраструктури та способів взаємодії її компонентів). Відтак, метою статті є системна характеристика впливу процесів маршрутизації та спільного функціонування клубів на якість інтегрованого управління їх функціонуванням. Авторами доведено, що маршрутизація даних є основою для прийняття обґрунтованих рішень. Збір, обробка та аналіз даних з різних джерел (ігрових серверів, фітнес-трекерів, опитувань гравців тощо) дозволяють отримати повну картину діяльності клубу та оптимізувати процеси. Основними компонентами системи маршрутизації даних є джерела даних, системи збору даних, бази даних, системи обробки даних, системи аналізу даних та системи візуалізації. Відзначено, що спільне функціонування передбачає, що всі відділи клубних систем кіберспорту та окремі клуби, які є їх учасниками, працюють як єдина команда, обмінюючись інформацією та підтримуючи один одного. Це забезпечує ефективність роботи, підвищує мотивацію співробітників та сприяє досягненню стратегічних цілей. Основними компонентами системи спільного функціонування є чітка структура, ефективна комунікація, спільні цілі, командна робота, регулярні зустрічі та системи автоматизації. За результатами дослідження доведено, що процеси маршрутизації та спільного функціонування в межах інтегрованого управління клубними системами кіберспорту передбачають підвищення ефективності, зниження витрат, поліпшення прийняття рішень, збільшення задоволеності співробітників і клієнтів, а також підвищення конкурентоспроможності клубу.

Ключові слова: кіберспортивні клуби, кіберспорт, складні системи, мережі клубів, комплексний підхід, оптимізацію управлінських процесів.



Problem statement. Esports, as one of the most dynamic segments of the modern entertainment industry, requires high player skill and effective organization and management of all internal processes [3]. The growing number of esports clubs, events, and leagues has led to the need for implementing complex data management systems (due to the exponential increase in the volume of data that needs to be collected, processed, and analyzed [6]) and changing approaches to ensure the seamless interaction of all infrastructure components (due to the continuous improvement of infrastructure and the ways its components interact [6]). Esports clubs have evolved from simple groups of players into highly organized structures encompassing various functions and departments. A notable example is the Fnatic esports club system, founded in 2004 in Sweden, which now has an extensive network of clubs competing in various disciplines such as League of Legends, Dota 2, Valorant, Counter-Strike: Global Offensive, and others. Thus, the formation of esports club systems (or a complex of interconnected elements and processes aimed at the effective organization of an esports club's activities [3]) and the development of theory and practice of integrated management of their operations have become core success factors in modern esports.

The analysis of recent researches and publications. The issue of integrated management of esports club systems is relatively new to scientific research. The limited number of publications can be attributed to the industry's youth and ambiguous perception.

One of the pioneering studies in this field is the work by V.F. Hromyk, A.P. Korolovych, and O.O. Korolovych, which analyzes the relationship between esports and digital tourism in the context of hybrid projects. The general aspects of integrated development in service organizations have been discussed in the works of Proscura V., Ilto T., and Mykulanynets S.

However, the question of how data routing processes and collaborative functioning affect the effectiveness of integrated management of esports club systems remains open and requires further investigation.

Purpose of the article. The article aims to provide a systematic characterization of the impact of data routing processes and the collaborative functioning of clubs on the quality of integrated management of their operations.

The paper main body with full reasoning of academic results. In the context of the research, it has been noted that integrated management

of club systems involves a comprehensive approach to organizing all aspects of their operations, not as individual entities but as a network of clubs, including [1; 4–5]:

1. Personnel Management, specifically recruiting and training players, coaches, and analysts, ensuring motivation and team development.

2. Financial Management, including budgeting, finding sponsors, and managing income and expenses.

3. Marketing and PR, focusing on promoting the joint brand of the clubs, engaging with the audience, and organizing esports events.

4. Legal Support, such as intellectual property protection, contract negotiation, and dispute resolution.

5. Technical Support, including maintaining gaming infrastructure, ensuring network stability, and protecting against cyber attacks.

From existing research, it is evident that data routing and joint functionality are key concepts in the context of modern esports club systems. This is because they are aimed at ensuring effective operations and achieving set goals.

So, data routing in the context of esports club systems is the process of collecting, processing, storing, and transmitting information between various system components. This process enables informed decision-making, optimizes workflows, and enhances the overall efficiency of the club. Note that data routing is important due to its impact on:

1. Informed decision-making (interpreted as the process of choosing the best course of action based on the analysis of available information [1–2]). For a club system, this is not merely an intuitive feeling or guesswork but rather a systematic approach involving the collection, processing, and data interpretation.

2. Optimization of management processes (interpreted as a continuous process of improving club operation methods, enhancing efficiency, reducing costs, and achieving better performance outcomes [4]). It involves analyzing existing processes, identifying bottlenecks, and developing new, more effective approaches.

3. Enhancing the competitiveness of the esports product (interpreted as a set of measures aimed at improving the position of a club, team, or individual player in the esports market). It means making the product attractive to sponsors, partners, audiences, and other key stakeholders.

4. Development of club personnel (interpreted as a set of measures aimed at

enhancing qualifications, skills, and motivation of employees in esports organizations [1]). It is not just training but a deliberate process that enables the club to achieve better results today while ensuring its sustainable development in the future.

According to the identified influences, the main components of the data routing system are: data sources, data collection systems, databases, data processing systems, data analysis systems, and data visualization systems. The systematic characteristics of these components are presented in Table 1.

Based on the provided data, it is evident that routing has a diverse impact on the management systems of esports clubs. This impact is characterized by the optimization of resource allocation, improvement or general adjustment of the effectiveness of training and competitive processes, strategic decision-making, and enhanced communication. The result is the establishment of a flexible and quickly adjustable development path that the esports club system must follow [2; 5].

So, each component of the data routing system plays a crucial role in ensuring effective

Table 1

Systematic characteristics of data routing components in esports club systems

Key components of data routing	Component characteristics	Impact of the component on the quality of integrated management of club systems	Impact result
Data sources	Game servers, statistical analysis platforms, fitness trackers, player surveys, etc. ¹	They provide the initial information for analysis. The accuracy of subsequent conclusions depends on the quality and diversity of the data.	Establishing the routing boundary for esports clubs
Data collection systems	Tools for automatic data collection from various sources ² .	Determine the speed and efficiency of information collection. Automating the collection process minimizes human error and enhances data accuracy.	
Databases	Repositories for storing collected data ³ .	Provide storage for large volumes of data in a structured format, enabling quick search and analysis of the necessary information.	
Data processing systems	Tools for data cleaning, transformation, and aggregation ⁴ .	Prepare data for analysis by removing errors and duplicates and standardizing the format.	
Data analysis systems	Tools for identifying patterns, trends, and building forecasts ⁵ .	Allow extraction of useful information from data, identifying causal relationships, and making informed decisions.	
Data visualization systems	Tools for visualizing analysis results ⁶	Facilitate understanding of complex data and enable quick communication of information to different categories of users.	

Note

1. Data sources, in addition to those mentioned, can include data from social networks, forums, financial systems, and so on.
2. Data collection systems may include APIs, web scraping, sensors, and other tools.
3. The choice of database type depends on the volume and structure of the data (relational, NoSQL).
4. Programming languages (Python, R), libraries (Pandas, NumPy), and ETL (Extract, Transform, Load) tools can be used to build such systems.
5. Include statistical methods, machine learning, and artificial intelligence.
6. Libraries (Matplotlib, Seaborn) and specialized tools (Tableau, Power BI) may be used.

Source: formulated by the author based on [2–3; 5]

management of the esports club system. Through the collection, processing, and analysis of data, clubs can make more informed decisions, optimize their processes, and achieve better results.

Integrated management of esports club systems is not possible without the collaborative functioning of esports clubs. It is evident that such functioning means that all departments and divisions of the club operate as a unified mechanism, interacting and supporting each other. Each part of the system performs its own function, but all are aimed at achieving a common goal – the success of all the clubs [5].

Examples of collaborative functioning include the interaction between club coaches and analysts. For instance, while club coaches develop training plans, analysts provide detailed

statistics and analysis of gameplay [6]. This allows for the creation of personalized training programs for each player.

Another example is the interaction between esports athletes and technical specialists. Esports athletes provide feedback on technical issues, and technical specialists promptly address these problems.

This ensures the smooth operation of gaming equipment and minimizes the risk of technical failures during competitions [3].

It should be noted that data routing is important due to its impact on [4; 6]:

1. Synchronization of Actions. So, all team members understand the common goal and work in the same direction.
2. Resource Optimization. By coordinating actions, resources are utilized more effectively.

Table 2

Systematic characteristics of the components of collaborative work in esports club systems

Key components of collaborative functioning	Component characteristics	Impact of the component on the quality of integrated management of club systems	Impact result
Clear structure	Organizational chart that defines roles, responsibilities, and interactions between departments and employees.	Ensures order, and clarity of each team member's role, minimizes function duplication, and facilitates decision-making	Increased work efficiency, reduced bureaucracy, and enhanced process transparency.
Effective communication	Information exchange system among all team members, including regular meetings, chats, and collaboration tools.	Promotes rapid information exchange, enhances employee engagement, and timely problem-solving.	Greater transparency, improved employee satisfaction, and fewer errors.
Shared goals	Clearly defined goals that unify all team members and set the direction for the club's development.	Creates a unified vision for the future, boosts employee motivation, and fosters focus on achieving results	Increased work efficiency, enhanced employee loyalty, and achievement of strategic goals.
Teamwork	An atmosphere of mutual support, trust, and encouragement among team members	Encourages knowledge and experience sharing, enhances creativity, and enables effective resolution of complex tasks.	Improved work quality, reduced conflicts, and higher employee satisfaction.
Regular meetings	Scheduled meetings to discuss current tasks, review work results, and address issues.	Allow for timely identification and resolution of issues, synchronize actions, and increase employee engagement.	Increased transparency, improved decision-making efficiency, and reduced risks.
Automation systems	Utilization of software to automate routine tasks, collect, and analyze data.	Frees up time for more complex tasks, enhances data accuracy, and improves decision-making quality.	Increased productivity, reduced error rates, and improved quality of analytics.

Source: formulated by the author based on [2; 4; 6]

3. Increased Productivity. Collaborative work allows for achieving better results in shorter timeframes.

4. Risk Reduction. Problems are identified and addressed at early stages.

According to the outlined influences, the main components of the collaborative functioning system are clear structure, effective communication, shared goals, teamwork, regular meetings, and automation systems.

The systematic characteristics of these components are presented in Table 2.

Each of the listed components plays a crucial role in establishing an effective collaborative functioning system within an esports club [4].

Through their interaction, high productivity can be achieved, employee motivation can be enhanced, and goals can be reached.

Conclusions from this study and prospects for further exploration in this direction. The research highlights that integrated management within the context of an esports club is a core factor for success. It has been demonstrated that this involves creating a unified system where all elements interact and support each other to achieve common goals. The following conclusions have been drawn:

1. Data routing is fundamental for making informed decisions. Collecting, processing, and analyzing data from various sources (gaming servers, fitness trackers, player surveys,

etc.) provides a comprehensive view of the club's activities and helps optimize processes. The main components of the data routing system are data sources, data collection systems, databases, data processing systems, data analysis systems, and visualization systems.

2. Collaborative functioning means that departments within the esports club system and the individual clubs involved operate as a unified team, sharing information and supporting each other. It ensures operational efficiency, boosts employee motivation, and contributes to achieving strategic goals. The main components of the collaborative functioning system are clear structure, effective communication, shared goals, teamwork, regular meetings, and automation systems.

The data routing and collaborative functioning within the integrated management of esports club systems aim to enhance efficiency, reduce costs, improve decision-making, increase employee and client satisfaction, and boost the club's competitiveness.

According to the outlined principles, future research prospects involve the development of integrated management platforms for esports clubs that would ensure effective data routing, process automation, and support for the collaborative functioning of all system components to enhance the clubs' competitiveness in the global market.

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