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A study on participant satisfaction and improvement strategies for marathon events in Taiwan

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Abstract

Since 2008, road running and marathon events in Taiwan have flourished. Although the COVID-19 pandemic temporarily reduced events, activities have gradually resumed, and marathons continue to attract many participants. This study explores participants' motivations and satisfaction with Taiwan's major marathons. Using surveys, it analyzes satisfaction and dissatisfaction with event services. Results show low satisfaction with registration and post-event services, especially payment systems, refund processes, and post-race recovery services. Pre-race services, such as accommodation and dining, scored lower, while racecourse design and traffic control require improvement. Timing services and aid stations received higher ratings, but finish-line shuttles and toilets along the route remain insufficient. The study suggests optimizing registration platforms, adding payment options, improving racecourse design, and strengthening post-race services. Enhancing volunteer training and providing timely event updates are also emphasized.

Keywords: Taiwan marathon, participant satisfaction, service quality, event quality improvement

1. Introduction

Since 2008, road running and marathon events in Taiwan have flourished, influenced by the international road running trend, gradually becoming an important symbol of national fitness. Between 2014 and 2019, the number of road running events in Taiwan reached its peak, with annual participation exceeding one million people and over 600 events held. Among these, professional races such as full marathons and half marathons attracted about 20%-30% of participants, while 10K races and recreational runs became the top choice for many runners ^[1]. These events not only raised public health awareness but also became effective tools for local governments to promote tourism ^[2].

However, the COVID-19 pandemic in 2020 had a severe impact on road running activities, significantly reducing the number of events, with many races forced to postpone or cancel ^[3]. As the pandemic's impact gradually eased, road running activities began to recover. Nevertheless, the total number of events in 2024 remains at only 473, not yet fully returning to pre-pandemic levels. Despite this, large-scale marathon events still attract a large number of participants and often reach capacity, demonstrating that the enthusiasm for running remains strong among the Taiwanese people, and running culture has deep roots in Taiwan ^[1].

With the rapid development of marathon sports in Taiwan, especially in recent years, participants' demands and expectations for events have gradually increased. Major marathons in Taiwan, such as the Taipei Marathon, New Taipei City WJS Marathon, and Kaohsiung Fubon Marathon, attract tens of thousands of runners and have become important activities to promote national fitness and local tourism ^[4]. Despite the growing scale of events, the quality of the events has a key impact on participant satisfaction, which in turn affects the event's reputation and future development ^[5, 6].

To improve the quality of these events, understanding participants' satisfaction and identifying areas of dissatisfaction are crucial. This not only helps to improve event operations but also enhances the overall experience for participants, further promoting the development of marathon activities. Therefore, this study aims to investigate the satisfaction of participants in six major marathons in Taiwan (Taipei Marathon, New Taipei City WJS Marathon, Kinmen

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Marathon, Kaohsiung Fubon Marathon, Taroko Gorge Marathon, and Tianzhong Marathon) and gather feedback on their areas of dissatisfaction. These events are not only significant sports activities in Taiwan but are also closely tied to local tourism and economic output. The results of this study will provide a deeper understanding of runners' real needs and offer specific suggestions for event organizers to improve the quality of the events, ensuring that they continue to attract more participants and drive the healthy development of Taiwan's marathon movement and sports industry.

2. Materials and Methods

To provide a comprehensive understanding of marathon event services, this study first reviews existing literature on service items that contribute to the overall participant experience. By categorizing these services into registration, pre-race, race-day, post-race, and additional value-added services, the study highlights how different aspects of marathon events impact runners' satisfaction and their perceptions of event quality. In addition to understanding service categories, this review also emphasizes the importance of evaluating each service item's effectiveness in enhancing the participant experience. This framework forms the basis for the survey and interviews conducted in the subsequent section, where data is gathered from participants of various major marathons in Taiwan.

2.1 Literature Review of Marathon Event Service Items

The service items of marathon events can be divided into registration services, pre-race services, race-day services, post-race services, and other services, with specific contents as follows (Table 1):

Registration Services: Registration services are a crucial part of marathon events, mainly including the following services [7-13]:

- **Online Registration Platform:** Provides an easy-to-use website with multilingual interfaces and various payment methods, making it convenient for participants to register.
- **Registration Confirmation and Payment Process:** A simple payment process after registration, offering instant confirmation and notification services to ensure participants receive timely responses.
- **Race Kit Delivery or Pickup Service:** The event organizer will either mail or set up a pickup point for race kits, including race numbers, timing chips, course maps, and clothing, helping participants prepare.
- **Event Information Notifications:** Regularly notifying participants about important event details, such as race time, location, and rules.
- **Health Management Support:** Providing health requirements and recommending participants to purchase relevant insurance to protect their health.

Pre-Race Services: Pre-race services aim to ensure the smooth running of the event and mainly include [2, 7, 9, 11, 13-16]:

- **Course Planning and Layout:** The planning and design of the course, including route markings and a comprehensive guidance system, ensuring participants can clearly understand the race route.
- **Safety and Medical Support:** Setting up first aid stations and providing medical services to offer emergency support for participants.
- **Aid Station Preparation:** Setting up aid stations along the course, providing energy bars, fruits, sports drinks, etc., to support participants in maintaining energy during

the race.

- **Item Storage Service:** Setting up designated areas for participants to store personal items, preventing items from being lost during the event.
- **Event Area Setup:** Establishing warm-up areas, traffic guidance, and shuttle services to provide convenient conditions for race preparation.
- **Traffic Control Planning:** Planning and implementing road closures and traffic diversion measures to ensure the event runs smoothly.
- **Cooperative Accommodation Plans:** Partnering with local accommodation providers to offer discounted lodging options to address participants' accommodation needs.
- **Cooperative Restaurant Discounts:** Partnering with restaurants to provide participants with discounts and exclusive dining options.

Race-Day Services: Race-day services are crucial as they directly impact participants' experience. The service items include [2, 7-11, 13, 14, 17]:

- **Course Guidance Services:** Volunteers assist participants in confirming the course and provide necessary support.
- **High-Precision Timing Service:** Providing accurate timing and instant results, ensuring the fairness of the race.
- **Aid Station Setup:** Setting up cold drink and hot drink stations, providing various aid options to meet different participants' needs.
- **Photography and Videography Services:** Setting up professional photography spots and providing post-race photo-sharing services, allowing participants to capture memorable moments.
- **Weather and Environmental Monitoring:** Offering weather updates and real-time monitoring of course safety.
- **Sweep Vehicle:** Providing a vehicle for slower participants or those who drop out, ensuring they return safely.
- **Restroom Setup:** Providing sufficient and clean restrooms along the course to meet participants' basic needs.
- **Interactive Services:** Offering music performances and motivational signs during the race to enhance the atmosphere and motivate participants.

Post-Race Services: Post-race services focus on participant recovery and convenience after the event, including the following [7, 8, 10-11, 13-15, 17]:

- **Finish Line Aid:** Providing recovery food and drinks at the finish line to help participants replenish energy.
- **Finisher Certificates and Medals:** Awarding finisher certificates and medals and providing result inquiry services to enhance participants' sense of achievement.
- **Photo Area Setup:** Setting up photo areas for participants to take commemorative photos, capturing unforgettable moments of the race.
- **Post-Race Recovery Services:** Offering massage stations and ice bath areas to help participants recover physically.
- **Photo and Video Sharing:** Creating digital albums for participants to download, enabling them to share highlights from the race.

- **Lost and Found:** Setting up a lost-and-found service to help participants retrieve any lost items.
- **Shower and Changing Facilities:** Providing shower and changing facilities on-site to meet participants' post-race needs.

Other Services: Value-added services aim to enhance participants' overall experience. The service items include [8, 9, 11, 12, 15, 16].

- **Parent-Child Run Categories:** Designing parent-child run categories, holding family groups and children's fun races, attracting more families to participate.
- **Environmental Measures:** Implementing eco-friendly practices, using reusable water cups and promoting waste sorting to create a green event.
- **Audience Services and Activities:** Setting up audience rest areas and local specialty product sales, enhancing the audience's event experience.
- **Specialty Product Display Areas:** Partnering with local specialty vendors to set up display and purchase points for a diverse shopping experience for the audience.
- **Volunteer Services:** Providing enthusiastic volunteer services to enhance interaction between the event and participants, adding a personal touch to the event.

2.2 Survey Interviews: This study conducted a survey

interview of six large-scale marathon events in Taiwan, each with over 10,000 participants annually (Table 1). A total of 86 public runners were interviewed, each of whom had participated in at least three events. The marathons included the Taipei Marathon, New Taipei City WJS Marathon, Kinmen Marathon, Kaohsiung Fubon Marathon, Taroko Gorge Marathon, and Tianzhong Marathon, among others. These events were selected as part of the "Shaping Taiwan Brand International Events Project" by the Ministry of Education's Sports Administration in Taiwan, which aims to promote Taiwan's local characteristics through collaborative marketing by the government, industry, and academia, and enhance the economic value of the sports industry. Among them, the Taipei Marathon and New Taipei City WJS Marathon have been certified as Gold Label events by World Athletics. Gold Label events represent the highest international standards, covering complete event management, accurate timing systems, high-quality athlete services, and safety measures. The Gold Label certification not only enhances the international prestige of these events but also makes them an important platform for attracting international athletes and audiences, further promoting Taiwan's influence in international marathon events and generating positive economic benefits for local tourism and the sports industry.

Table 1: Major Marathons in Taiwan

Name	Time	Website	Organizer	Certified Event	Participants and Categories
Taipei Marathon	Every December	https://www.taipeicitymarathon.com/	Taipei City Government, Chinese Taipei Athletics Association, Chinese Taipei Road Running Association	World Athletics Gold Label Certified Event	28,000 people (Full Marathon: 9,000, Half Marathon: 19,000)
New Taipei City WJS Marathon	Every March	https://wanjinshi-marathon.com.tw/	New Taipei City Government, Chinese Taipei Athletics Association	World Athletics Gold Label Certified Event	11,000 people (Full Marathon: 5,000, 10K: 6,000)
Kinmen Marathon	Every January	https://www.sportsnet.org.tw/	Kinmen County Government, Chinese Taipei Road Running Association	None	15,800 people (Full Marathon: 2,000, Half Marathon: 3,300, 10K: 3,500, 4K: 7,000)
Kaohsiung Fubon Marathon	Every January	https://www.khm.com.tw/	Kaohsiung City Government, Chinese Taipei Athletics Association	None	20,000 people (Full Marathon: 5,000, Half Marathon: 8,000, 3K: 7,000)
Taroko Gorge Marathon	Every November	https://www.taroko-marathon.com.tw/index.php	Hualien County Government, Hualien County Marathon Road Running Association	None	14,000 people (Full Marathon: 3,000, Half Marathon: 5,000, 12K: 3,000, 3K: 1,000)
Tianzhong Marathon	Every November	https://www.tianzhongmarathon.com/	Changhua County Government, Chinese Taipei Sports Association, Changhua County Marathon Road Running Association	None	16,500 people (Full Marathon: 4,000, Half Marathon: 6,000, 10K: 6,500)

2.3 Survey Interviews

Interviews were conducted with participants of six major marathon events in Taiwan, each with over 10,000 participants annually. A total of 86 recreational runners who had participated in at least three of these events were surveyed. The survey covered various aspects of event services and asked respondents to rate their satisfaction and express any dissatisfaction. The following presents the analysis of satisfaction ratings and dissatisfaction comments.

This data helps us gain a deeper understanding of participants' evaluations of different service aspects and provides specific reference for improvements in future events.

Table 2 presents the satisfaction ratings of the respondents, along with their dissatisfaction comments regarding various event services. These reflect the challenges and expectations that participants may encounter during the event experience, offering event organizers valuable insights for future improvements.

Table 2: Satisfaction Ratings and Dissatisfaction Comments

Service Category	Service Items	Average Satisfaction (1-5 scale)	Dissatisfaction Comments
Registration Services	Online Registration Platform	4.28	The website operation is not smooth, feels complicated.
			The payment method is inconvenient and the process is a bit cumbersome.
			Registration had to be repeated several times before succeeding.
			Refund process is not smooth and takes too long.
			The registration fee seems not worth it compared to the services provided.
	Registration Confirmation and Payment Process (with immediate confirmation and notification services)	4.51	Concerns about the security of personal data.
			Did not receive confirmation immediately after payment.
			The process was unclear, and information was not transparent.
			Refund speed is slow, and problem resolution efficiency is low.
	Participant Pack Delivery or Pickup	4.41	Received a suspicious scam call, which made me feel uneasy.
			Instructions to pickup location were unclear, making it easy to get lost.
			Long waiting times, causing delays in preparations.
			Delivery was too slow, did not receive the race packet on time.
	Event Information Notification	4.47	Package was damaged upon arrival, affecting usage.
			The quality of the race packet was average, and the souvenir design was rather plain.
			Race information was not updated in time, causing inconvenience.
Updates were slow, sometimes information was outdated.			
Some event details were incorrect and corrections were not quick enough.			
Participant Health Management	4.43	The lottery method was not user-friendly, making participation harder.	
		The conditions for bypassing the lottery were too strict.	
Pre-Event Services	Track Planning and Setup	4.11	The time limit for the race was too tight, causing pressure.
			Health management information was incomplete, missing some details.
			Lack of insurance options, causing concerns about safety.
			Course markings were not clear, making it easy to go off track.
			The course was too narrow, causing difficulty in movement.
	Safety and Medical Arrangements	4.45	The starting area was too cramped, making it crowded for participants.
			The course was crowded, leading to disorder.
	Aid Station Preparation	4.38	There were no groupings based on ability at the start, making the race less smooth.
			There was mixed traffic on the course, making it unsafe.
			Emergency response was slow, and notifications were sometimes not timely.
	Item Storage Services	4.43	Aid stations had limited food options.
			Aid stations were understocked and supplies were insufficient.
			The layout was poorly designed, causing congestion.
	Event Area Setup	4.08	The space at the aid stations was cramped, and order was poor.
			The storage area was small and crowded.
	Traffic Control Planning	4.13	Long wait times to retrieve bags.
The bag storage service had limited operating hours, which was inconvenient.			
Accommodation Partner	3.88	The warm-up area was too small, restricting participant movement.	
		Transportation directions were unclear, causing confusion.	
		Traffic control was unreasonable, with runners needing to stop at traffic lights.	
Restaurant Partner	3.79	There was mixed traffic on the route, presenting safety risks.	
		Accommodation discount information was unclear and hard to understand.	
During Event Services	Track Guidance	4.32	Unable to book accommodation in advance, causing inconvenience.
			Accommodation conditions were average and did not match the promotional details.
	Timing Services	4.51	Restaurant service quality was low, leading to a poor dining experience.
			Limited food options, lacking variety.
	Aid Services	4.41	Discounts offered were minimal and lacked appeal.
			Volunteer guidance was unclear, with limited help.
	Photography and Videography	4.25	There were not enough volunteers to maintain order.
			There were delays in posting results.
	Weather and Environmental Monitoring	4.11	The timing system was unstable, making it hard to check results.
			Chip malfunctions affected the accuracy of results.
Sweep Vehicle (Post-Race Pickup)	4.02	Drink supply was insufficient, not meeting demand.	
		Hygiene was poor, trash was not cleaned up in time.	
On-Route Toilet Setup	3.85	Photo area setup was unclear, leading to a poor experience.	
		Photo quality was low, and the prices were high.	
Interactive Services Along the Track	4.34	Response to extreme weather was insufficient, and no effective solutions were provided.	
		Recovery vehicle arrangements were inadequate, causing long wait times for dropouts.	

Post-Event Services	Finish Line Supplies	4.23	The quality of recovery supplies was average, not meeting recovery needs. Limited food choices and a lack of variety. Long waiting times, making it inconvenient.
	Finisher Certificate and Results Inquiry	4.47	Printed certificates lacked waterproof features, making them prone to damage. The result inquiry system was unstable, leading to a poor service experience.
	Medal and Awards Distribution	4.42	Medal designs were too simple, lacking character.
	Post-Race Recovery Services	3.86	Recovery services were not professional enough, with limited effectiveness. Limited availability, with long waiting times.
	Photo and Video Sharing	3.74	Uploading photos and videos was slow, affecting the sharing experience. Photo area design was not ideal, and the quality was poor.
	Lost and Found	4.07	The lost-and-found process was complicated and inconvenient.
	On-Site Showers and Changing Facilities	3.89	Few shower facilities. Changing area facilities were basic.
Other Services	Parent-Child Run Design	3.89	Safety measures were insufficient, making it feel unsafe.
	Environmental Measures	3.76	Waste sorting and cup recycling were not properly implemented.
	Spectator Services and Side Activities	3.89	The spectator rest area lacked seating, and was uncomfortable.
	Specialty Product Partner	3.88	Limited product selection and lack of variety. Prices were high, with poor cost-performance ratio.
	Volunteer Services and Event Interaction	4.35	Volunteer services lacked enthusiasm and support was insufficient.

3. Results & Discussion

This section examines participant satisfaction with registration, pre-event, event-day, post-event, and other services. According to the survey results, satisfaction levels varied across service stages, from registration to post-event services. The analysis highlights both areas of satisfaction and areas requiring improvement, with recommendations proposed to enhance overall service quality and participant experience.

3.1 Registration Service Satisfaction and Improvement Suggestions

- High Satisfaction (Average 4.28–4.51)
- **Strengths:** The smooth confirmation and payment process achieved the highest satisfaction score (4.51), indicating efficiency and convenience.
- **Weaknesses:** Issues such as a complicated online registration platform, inconvenient payment methods, and inefficient refund procedures lowered participant satisfaction.

Recommendations

- Optimize the website's user experience by simplifying registration steps.
- Introduce more payment options, such as mobile payments and installment plans.

3.2 Pre-Event Service Satisfaction and Improvement Suggestions

- Moderate Satisfaction (Average 3.79–4.45)
- **Strengths:** High satisfaction with safety and medical arrangements (4.45) reflects strong health and safety measures.
- **Weaknesses:** Accommodation providers (3.88) and dining service providers (3.79) scored the lowest, suggesting unmet participant expectations for these amenities. Additionally, course design and traffic management had shortcomings affecting the event experience.
- **Recommendations**
- Improve course planning by increasing starting area space and clearly marking routes.
- Strengthen traffic control to prevent vehicle-pedestrian

conflicts and ensure safety.

- Offer more attractive accommodation and dining packages and improve their quality to boost satisfaction.

3.3 Event-Day Service Satisfaction and Improvement Suggestions

- Moderately High Satisfaction (Average 4.02–4.51)
- **Strengths:** Timing services (4.51) and refreshment services (4.41) received high scores, reflecting effective core event-day support.
- **Weaknesses:** The sweep vehicle (4.02) and restrooms along the course (3.85) had the lowest satisfaction scores, highlighting deficiencies in convenience and hygiene.
- **Recommendations**
- Increase restroom availability along the route and reduce waiting times.
- Expand sweep vehicle coverage and improve response efficiency.
- Enhance course interaction, such as adding music stations and motivational signage to improve the event atmosphere.

3.4 Post-Event Service Satisfaction and Improvement Suggestions

- Lowest Satisfaction (Average 3.74–4.47)
- **Strengths:** High scores for result inquiries (4.47) and medal design (4.42) highlight strong performance in key services and memorabilia quality.
- **Weaknesses:** Photo and video sharing (3.74) and recovery services (3.86) scored lowest, particularly due to lack of professionalism and long waiting times for recovery services.
- **Recommendations**
- Improve the efficiency of photo and video sharing to enhance participant experience.
- Increase the professionalism of recovery services and provide more facilities to reduce waiting times.
- Expand and improve shower and changing facilities.

3.5 Other Services Satisfaction and Improvement Suggestions

- Relatively Low Satisfaction (Average 3.76–4.35):
- **Strengths:** Volunteer services and event interactions

(4.35) scored highly, reflecting effective order maintenance and participant assistance.

- **Weaknesses:** Environmental measures (3.76) and photo/video sharing (3.74) had the lowest satisfaction, highlighting deficiencies in sustainability and digital services.
- **Recommendations**
- Strengthen waste sorting and cup recycling efforts to enhance environmental measures.
- Provide more comfortable seating and diverse activities for spectators.
- Increase the variety of local specialty displays and offer attractive pricing and discounts.

3.6 Problem Categorization and Countermeasures

3.6.1 Issues with Immediate Impact and High Priority

These issues significantly affect participants' experiences, and addressing them in the short term can greatly enhance event efficiency and participant satisfaction.

(1) Registration and Payment Process

- **Unfriendly website interface:** The website design is overly complicated. It is recommended to redesign the interface, simplify the registration process, and improve operational convenience and smoothness.
- **Inconvenient payment options:** Consider modern users' payment habits by adding more options, especially mobile payment methods (e.g., Apple Pay, Google Pay), to improve payment convenience.
- **Delayed confirmation notifications:** Registration confirmation delays can cause participant anxiety. An automated system should be implemented to send immediate notifications upon successful registration, increasing participant reassurance.

(2) Course Design and Safety

- **Unclear route markers:** Inadequate signage on the course may cause participants to miss critical directions. Strengthen course markers with clear signage and ground markings.
- **Insufficient supplies at aid stations:** Aid stations lack adequate resources, leaving participants underserved. Increase supply reserves to ensure stations meet participant needs.
- **Inefficient aid station layout:** Poor layout causes congestion, reducing aid efficiency. Redesign aid station flow for better functionality.
- **Congested starting area:** Crowding at the start line affects participants' takeoff. Redesign the starting area and consider staggered starts to avoid congestion.
- **Slow emergency response:** Delayed emergency measures increase risks in critical situations. Add more emergency personnel and equipment to improve responsiveness and ensure safety.

(3) Pre-Race Preparation

- **Unclear collection instructions:** Ambiguous instructions for materials collection lead to confusion. Provide clear guidance (e.g., maps or detailed steps) to help participants locate collection points efficiently.
- **Untimely information updates:** Participants cannot access the latest updates due to delayed information. Implement a real-time notification system through the website or app to ensure transparency and timeliness.

(4) Volunteer Services

- **Unclear volunteer instructions:** Insufficiently trained volunteers may lack understanding of event procedures and participant needs, causing service gaps. Enhance volunteer training to ensure familiarity with event processes and participant requirements.
- **Inadequate volunteer numbers:** A shortage of volunteers hinders effective service provision. Recruit more volunteers and allocate them appropriately to ensure adequate support for each area.

3.6.2 Long-Term Issues Requiring Strategic Planning

These issues require long-term planning and improvements. Although their impact may not be immediately apparent, resolving them will significantly enhance overall event quality and participant satisfaction.

(1) Registration and Payment Process

- **Data security risks:** The event registration system poses risks to participant data security. Implement comprehensive encryption and privacy protection measures to safeguard personal information.
- **Slow refund processing:** The refund process is cumbersome and lengthy. Simplify and accelerate the process to reduce participant waiting times when cancellations are necessary.

(2) Course Design and Safety

Mixed pedestrian and vehicle paths: Certain course designs do not adequately separate pedestrians from vehicles, posing safety risks. Collaborate with local authorities to optimize traffic management and ensure pedestrian-vehicle separation.

(3) Pre-Race Services

- **Insufficient health management guidance:** Participants lack adequate health management advice before the event. Provide health guidelines or online consultation services to help participants prepare effectively.
- **Professional training support is often unavailable,** posing a challenge for some participants. Offer professional training courses or resources to help participants improve their performance.

(4) Post-Race Services

- **Slow photo and video uploads:** Post-race photos and videos take too long to become available, frustrating participants. Collaborate with professional teams to expedite processing and reduce upload times.
- **Insufficient post-race facilities:** Post-race facilities are inadequate, leaving participants without comfortable spaces to rest. Expand event facilities, including more showers and rest areas, to improve the post-race experience.

3.6.3 Issues with Moderate Priority and Immediate Solutions

These issues affect certain event details. While less urgent, addressing them can significantly enhance participant experiences.

(1) Aid Stations

- **Limited variety of supplies:** Aid stations offer too few items, leaving participants without desired options. Increase the variety of supplies, such as energy bars, fruits, and beverages, to meet diverse needs.

- **Insufficient volunteers at aid stations:** A lack of volunteers leads to long wait times for participants. Temporarily recruit additional volunteers to improve efficiency.

(2) Results and Timing Issues

- **Delayed results announcements:** Slow result announcements frustrate participants. Use efficient timing and announcement systems to ensure quick result releases.
- **Timing chip malfunctions:** Occasional malfunctions affect timing accuracy. Conduct pre-event checks on timing equipment to ensure proper functionality.

(3) Participant Kits

- **Subpar quality:** The quality of commemorative items in participant kits fails to meet expectations. Adjust the design and improve the quality and practicality of items.
- **Delayed delivery:** Some participants report delays in receiving their kits. Optimize logistics to ensure timely delivery of race materials.

4. Conclusion

This study conducted an in-depth analysis of satisfaction with event services and proposed improvement suggestions. The results indicate that participants were generally satisfied with the registration services, particularly with the smooth registration confirmation and payment processes. However, dissatisfaction was noted regarding the complexity of the online registration platform and the limited payment options. Pre-race services received moderate satisfaction levels. While health protection measures were well-received, the quality of accommodation and dining services fell short of participants' expectations, and issues with course design and traffic control require attention.

Core race-day services such as timing and refreshment stations were highly rated, but dissatisfaction persisted with the arrangement of recovery vehicles and restroom facilities along the route. Post-race services showed positive feedback for result inquiries and medal designs; however, there is room for improvement in the quality and efficiency of photo and video sharing, as well as recovery services. Among other services, volunteer support was well-regarded, but environmental measures and digital services need significant enhancement.

From the perspective of issue prioritization and countermeasures, several critical issues that significantly impact participants' experiences should be addressed immediately, such as optimizing registration and payment processes, improving course design, and enhancing emergency response capabilities. Additionally, long-term challenges, such as course safety and design, pedestrian-vehicle separation, and pre-race health management guidance, if progressively improved, could greatly enhance the overall quality of events and participant satisfaction.

In conclusion, this study provides concrete directions for improving event services. By optimizing service processes, upgrading facilities, strengthening volunteer support, and enhancing post-race recovery measures, participant experiences can be effectively enhanced. These improvements will foster the sustainable development of events and increase participation rates.

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