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A User's Perspective on the Factors Influencing the Satisfaction of Assistive Technology Resources Centers' Built Environment Services

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Abstract: Taiwan will move into a super-aged society by 2025. The government is actively establishing assistive technology resources centers (ATR Centers) throughout Taiwan to provide assistive technology services such as display, evaluation, rental, and maintenance services; they also recycle unused assistive devices, disinfect and clean them, and then rent them to people in need to achieve sustainable development. This study investigates the users' perceptions about receiving services from the ATR Center in Yunlin and explores their satisfaction. "Service convenience", "service quality", "user experience" and "corporate social responsibility (CSR)" were used as the overall research framework and hypotheses are based on the mediating role of "CSR"; data are collected through questionnaires, and structural equation modeling (SEM) is used to test the model and hypotheses. A total of 532 valid questionnaires were collected from the users and caregivers who had used the services of the center in the past two years. The statistical analysis was conducted in three stages: sample data analysis, measurement model validation, and structural equation model analysis. According to the research findings, service convenience, service quality, and user experience all have a significant positive impact on CSR. Additionally, service convenience, service quality, user experience, and CSR have a positive impact on user satisfaction. Moreover, service quality and user experience indirectly affect user satisfaction through CSR. Finally, based on the research results, suggestions are proposed for addressing issues related to assistive service promotion and future adjustments.

Keywords: assistive technology resources center; service convenience; service quality; user experience; corporate social responsibility; user satisfaction



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1. Introduction

In the next 30 years, the world is about to experience rapid aging, with the elderly population expected to double [1]. Taiwan became an aging society in 2018, and according to data from the National Development Council [2], it is expected to become a super-aging society by 2025, with the elderly population accounting for more than 20% of the total population. The wave of population aging is sweeping the world. At the same time, the number of people with disabilities in Taiwan is as high as 1.195 million, accounting for 5.1% of the total population. As the number of elderly and disabled people rapidly increases, the issue of a large number of people becoming disabled and increasing the burden of family care will arise. In addition, Taiwan is facing a population trend of low birth rates, which is testing the country's social resources shortage in caring for these people. Assistive devices (such as wheelchairs and crutches) can improve the abilities of individuals or reduce the burden on caregivers, but the difficulty of obtaining assistive services increases with physical disabilities or mobility difficulties. In central Taiwan's Yunlin County, the elderly population had already exceeded 20% in September 2022, making it a super-aged society. Nearly 70% of the townships in Yunlin have a population of elderly people over 20%, which

is the third-highest proportion of elderly people in Taiwan. In addition, the population of people with disabilities in Yunlin accounts for 7.43% of the total population, which is the fourth-highest in Taiwan. Therefore, the proportion of assistive technology users in Yunlin is extremely high, and it is one of the few counties in Taiwan with a high proportion of both elderly and disabled populations. Therefore, how to improve the convenience and sustainability of services, and provide good service quality and quality user experience, has become an important issue.

Elderly or disabled individuals can improve their quality of life through the use of appropriate assistive devices, which require corresponding assistive technology services. Assistive technology includes assistive technology devices and assistive technology services [3], which encompass the selection, acquisition, and use of assistive devices. In Taiwan, the revised People with Disabilities Rights Protection Act [4] requires the establishment of assistive technology resources centers (ATR centers) in each county and city, with professional personnel such as physical therapists, occupational therapists, or social workers providing assistive technology services to people with disabilities. As of the end of 2022, 35 ATR centers have been established [5].

In addition, Taiwan launched Long Term Care 2.0 in 2018, which not only provides assistive subsidies for the elderly, but also integrates assistive technology services from ATR centers, including assistive device display (Figure 1), device assessment, rental, maintenance, and home-based services. To facilitate the reuse of assistive devices, the centers also provide device recycling services, collecting unused devices from the public, disinfecting and cleaning them, and then renting them to those in need, promoting sustainable development.



Figure 1. Assistive Resources Center in Yunlin County (the image was shot by the authors).

In addition to setting up ATR centers in Taiwan, considering the mobility difficulties of disabled individuals, starting from 2018, assistive technology service bases and assistive technology convenience stations were established based on the geographical characteristics of each county/city, the availability of public buildings, living circles, and people's medical habits (see Figure 2), to improve service accessibility and convenience. In addition, to improve the overall quality of assistive technology services, the ATR centers are required to have a certain amount of space and a certain number of necessary human resources, displayed assistive technologies, and other work equipment standards. The overall satisfaction of the service is also required to be surveyed [6].

Since assistive devices are usually used after the onset of illness or disability, people tend to discard them once they are no longer needed due to recovery or the end of life due

to severe disability. If they are not properly reused, this may have a significant impact on the environment. One important task of ATR centers is to provide “second-hand assistive device recycling” and “assistive device rental” services. When people have assistive devices that they no longer use, they can be collected for reuse. After undergoing strict disinfection and cleaning procedures, the assistive devices can be rented to those who need them, which is in line with the spirit of corporate social responsibility (CSR). In the current global environment of resource depletion and climate change, how to integrate resources for reuse has become one of the issues of sustainable management for organizations. If assistive devices are obtained through leasing services, it is in line with the current trend of environmental protection, and it can help more short-term disabled individuals or those who need to frequently replace different types of assistive devices [7]. Not only assistive devices, but also many other products such as vehicles or clothing have received much discussion and research [8]. For example, consumers are willing to rent electric vehicles and are willing to pay more to indicate their positive attitude towards environmental protection [9].



Note: “若瑟醫院輔具服務據點” = Assistive Technology Service Base of ST. Joseph’s Hospital.

Figure 2. Assistive technology service base in Yunlin County (the image was shot by the authors).

Therefore, to make efforts toward social and environmental protection, consumption and service models are gradually changing. Enterprises or organizations use “Product-Service Systems” (PSS) to provide social services and sustainable solutions. Based on the concepts of circular economy and sharing economy, they establish business models that emphasize not only tangible products but also customer experience and the functions provided by the products [10]. This not only helps to extend the life of the products but also achieves sustainable development goals. By designing and developing new products, usage intensity is increased and other value chains are optimized to bring about resource efficiency [11,12], reducing manufacturing costs and waste generation, and bringing many benefits to the environment and economy [13].

In recent years, most service organizations or profit units have been actively seeking ways to deliver service value or increase consumer willingness to purchase through positive service experiences, thereby transforming the driving force of sustainable development in society. Therefore, in recent years, the public sector has also provided new services and products through innovative services to optimize the service experience and improve efficiency and public satisfaction [14]. Many countries also adjust their own public sector business from the perspective of serving customers, increasing interaction with the public

and caring about their feelings [15], hoping to provide more convenient services by simplifying relevant administrative procedures or shortening waiting times for public affairs. Chang and Huang [16] pointed out in their research on the impact of ATR center services on the reputation of public units that assistive device users care about service convenience, and service convenience also has a positive impact on the reputation of public units, and they have a similarly positive view on enhancing the perceived value of services.

Y.-W. Chang and Polonsky [17] conducted a study on the convenience of fitness centers and found that the convenience of benefits and post-benefit services are related to the customers' behavioral intentions to receive services, and customer satisfaction serves as a mediator factor that partially moderates the relationship between these two conveniences. In addition, another study on service quality in the banking and mobile communication industries also found that service convenience and perceived service fairness have a positive impact on customer engagement behaviors [18]. However, due to the aging population in Taiwan, the government is actively establishing assistive service resources, allocating funds to subsidize the hiring of professional manpower and setting up service outlets of different scales to enhance convenience, and improving service quality through evaluation mechanisms [19]. Therefore, when elderly people or people with disabilities require assistive devices, how to provide convenience and good service quality and user experience while also considering environmental protection and sustainable development has become an important issue.

This study specifically examines the assistive technology resources center as its research subject. Previous studies have primarily focused on the architectural design of the center and the planning of service processes, lacking quantitative empirical research from the user's perspective. In order to fill this gap, this study takes a novel research approach by evaluating the correlations between the environment, facilities, and human perception within the assistive technology resources center. The findings of this research can offer valuable decision-making support to senior executives responsible for the center. Therefore, this study aims to explore the perceptions of assistive technology service users (including users and caregivers) towards the services provided by ATR centers. After conducting a literature review, the independent variables were identified as "service convenience", "service quality", "user experience", and "corporate social responsibility (CSR)", with "service satisfaction" as the dependent variable. As past studies have not explored the topic, CSR was used as the mediating role to investigate the service satisfaction of people who use assistive technology services. Through this study, it is hoped to understand the experiences and perceptions of assistive technology service users towards the services provided by the government and to understand the impact of promoting sustainable development on the overall service quality. This study can serve as a reference for policy planning and contribute to the development of a better assistive technology service system, ultimately leading to a higher quality of life for society, especially as the aging population continues to rise.

2. Literature Review

According to statistics as of the end of 2021, the number of people with disabilities in Taiwan is approximately 1.2 million [20]. The elderly population (65 years old and above) is 3.939 million, accounting for 16.85% of the total population, which has reached the definition of an aged society by the World Health Organization (WHO). The survey conducted in Yunlin County for this study in September 2022 showed that the county has reached a population of 20% for the elderly, which is considered a "super-aged society", indicating a significant increase in the demand for assistive devices for people with disabilities and aging-related needs.

Taiwan's county and city governments have set up ATR centers in accordance with the Disability Rights Protection Act [4]. Assistive technology resources centers (ATR centers) are units established by the Taiwanese government to provide assistive technology services. In the early stages, the focus of these centers was on the reuse of assistive technology resources and linking service resources. They employed social workers to provide case

management services, resource development, and resource referrals for assistive technology services. In recent years, with the rapid increase in demand for assistive technology devices, the government has also emphasized the development of professional assistive technology services and cultivated ATR centers to provide assistive device evaluation, maintenance, recycling, display, and rental [21]. To meet the short-term assistive device needs of users (such as temporary fractures or sprains) and considering environmental and sustainable concepts, the ATR centers provide rental services for unused devices, which are recycled, disinfected, and provided as second-hand rental devices [7], reducing resource waste (Figure 3). Anyone in need can seek assistance from the ATR centers set up by local governments. Therefore, how to balance environmental protection and sustainable development while providing convenient and high-quality services will be a major challenge for an aged society, and relevant practices may affect users' satisfaction with ATR centers.

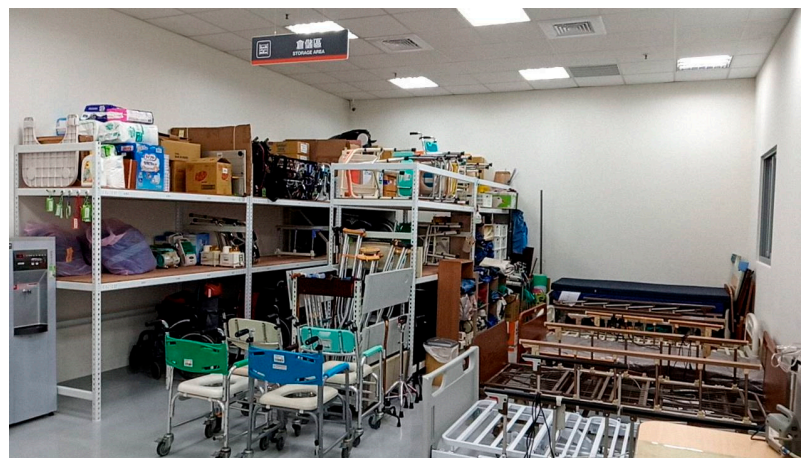


Figure 3. Second-hand assistive devices (the image was shot by the authors).

This study will review the literature to find the definitions and related research for each construct and infer the relationships between variables to form hypotheses. The relevant contents are as follows:

2.1. Total Quality Management

This study builds upon the concept of total quality management (TQM) [22] proposed by multiple scholars, management experts, and organizations. TQM aims to enhance organizational competitiveness, promote business growth, and improve service quality and customer satisfaction through a comprehensive approach. A good user experience is associated with a better perception of service quality, leading to more positive evaluations of the service. Therefore, this study is based on this research model and further investigates the factors of service convenience and Corporate Social Responsibility (CSR), which are emphasized by assistive technology resources centers (ATR centers). These modifications are made to enhance the research model and provide a comprehensive analysis of the topic.

2.2. Service Convenience

The purpose of service convenience is to minimize the psychological pressure or sacrifice associated with using a service or making a purchase, which includes several different types, according to Leonard L. Berry, Seiders, and Grewal [23]. Seiders et al. [24] defined five different types of service convenience: (1) decision convenience, related to beginning the process of deciding to use a service; (2) access convenience, reducing the time and effort required to initiate a service; (3) usage convenience, related to the time and effort required to experience the service content; (4) transaction convenience and the time and effort expended during a transaction; and (5) post-transaction convenience related to the time and effort required to reconnect with the organization.

In a study on hospital patient satisfaction by Kumar, Bera, and Chakraborty [25], it was found that healthcare organizations are actively improving services and formulating strategies to provide convenient services to patients. Service convenience was identified as an important factor in improving the flexibility of healthcare services, and the study also found that service convenience has a positive impact on patient satisfaction. In a study on the impact of ATR center services on the reputation of public agencies by T.-Y. Chang and Huang [16], it was pointed out that assistive device users value service convenience, service convenience has a positive impact on the reputation of public agencies, and both have a positive impact on the perceived value of services.

2.3. Corporate Social Responsibility (CSR)

Any action taken by an organization not only affects itself but also has an impact on the external environment [26]. In recent decades, society has become increasingly concerned about the impact of organizational management on climate change, environmental degradation, and resource scarcity, as well as health and human rights. Therefore, political or other external pressures have prompted organizations to incorporate social, environmental, and moral responsibilities into their overall operational strategies to enhance value for all stakeholders and to use diverse knowledge and resources to promote sustainable development, such as renewable energy development, waste reduction, or circular economy initiatives [27]. CSR is a proactive contribution made by an organization based on its impact on society, to pursue business objectives while also striving for social benefits. Research has shown that emphasizing CSR in organizational operations can enhance customer loyalty and regulate such associations through value co-creation [28].

Sustainability often plays an important role in government policies, and the concepts of social responsibility and sustainable development are closely related, especially in integrating economic, social, and environmental issues, which interact and are interrelated. Therefore, the government plays an active role in promoting the practice of social responsibility and should become a “promoter” of CSR” [29]. According to Navarro Espigares and Hernández Torres [30], the public sector should not only promote social responsibility initiatives and policy advocacy but also apply CSR to its relevant departments and set an example for private enterprises and the public [31].

According to Mackey et al., customers are more willing to visit institutions or stores with social responsibility [32]. Casado-Díaz et al. also pointed out that CSR has been proven to be more influential in service industries [33]. At the same time, research shows that CSR is one of the important characteristics of corporate image, which can attract consumers. CSR can also be used as a strategic resource to increase attractiveness and competitive advantage by enhancing reputation and brand value [34]. In a study on the influence of reputation in assistive technology service centers, it was found that service convenience has a direct influence on reputation. On the other hand, ATR center-related factors such as brand, service environment, or service system design have an indirect impact on reputation [16]. Image and reputation, both representing positive quality in a company’s external public relations, belong to the structures of asymmetric and symmetric models, respectively [35,36].

In summary, when people receive services at ATR centers, the higher the perceived level of convenience of the centers’ services, the higher the perceived level of CSR of the center. Therefore, this study hypothesizes that the convenience of services will have a positive and significant impact on CSR. The research hypothesis H1 is proposed as follows:

Hypothesis 1 (H1). *The convenience of services will have a positive and significant impact on CSR.*

2.4. Service Quality

Parasuraman et al. [37] proposed a conceptual model of service quality that divides it into five major dimensions: reliability, responsiveness, assurance, empathy, and tangibles. In a study of factors affecting the reputation of ATR centers [16], it was found that the space,

equipment, information conveyed, professionalism, friendliness, and reliability of the brand provided by the center for assistive devices, which serves people with disabilities or elderly people who have lost their ability, have a direct or indirect impact on the perceived value or reputation of the center by users.

In the study on whether consumers are willing to pay a premium for luxury goods due to CSR actions and brand value [38], it was found that consumers value the perceived value of the brand, especially when luxury goods have symbolic brand value, and will be willing to pay a higher price for brands that have enhanced CSR activities. Maon [39] and others believe that stakeholders within and outside the organization often express diverse social issues that are often conflicting. Therefore, when designing CSR programs, organizations should be viewed as a system to prioritize and integrate organizational goals and use systemic thinking to find the best practices for CSR. Moreno and Kang [40] expressed in their study on CSR communication that CSR communication can establish a lasting relationship with consumers and build preferences and loyalty towards the company. CSR communication can also identify consumer needs from the content and delivery. The study found that the content of CSR communication has a positive impact on building a responsible organizational image, but it should emphasize the demonstration of CSR activities and their alignment with the organization's core business values.

Therefore, the higher the perceived service quality when people receive services at the ATR center, the higher their perception of the center's CSR. Therefore, this study hypothesizes that service quality will have a positive and significant impact on CSR, and proposes the following research hypothesis:

Hypothesis 2 (H2). *Service quality will have a positive and significant impact on CSR.*

2.5. User Experience

The International Organization for Standardization (ISO) defines user experience in ISO 9241-210 as the subjective perception and feedback generated by users when they interact with a product, system, or service. It encompasses all users' emotional, belief-related, preference, cognitive, physiological, and psychological responses that are brought about by the behavior of the interactive system. It is also the result of combining users' prior experiences, attitudes, skills, and personalities [41]. Therefore, in the increasingly well-known process of "service design", there are several important factors for optimizing the user service experience, starting with user experience, such as "user-centered", emphasizing services centered on user experience, and understanding the real needs of users. Secondly, it emphasizes every touchpoint of the service, including a series of specific behaviors in service interaction, from the pre-service stage, the actual service stage, to the post-service stage, ensuring that users have a pleasant experience throughout the service process [42].

For example, in healthcare services, the introduction of service design methods can create innovative services that understand the needs of relevant departments, collaborating vendors, and patients, and prioritize patient experience to improve care quality. Therefore, patient experience and feedback on service are important sources of information for designing and improving medical services [43].

Moreover, as user experience is the perceptual experience of the overall service, in the application research of smart technology devices [44], service providers consider the user's entire journey, and users can feel the convenience brought by smart technology in the resources, space, and environment during the journey. Such friendly interaction can also be applied to remote health monitoring services for the elderly, providing sustainable and innovative service experiences. In addition, a study [45] of students' attitudes toward the use of outdoor space on university campuses found that some students' educational experiences depend on good campus design. The visual factor and spatial configuration of a campus site can provide the most comfortable campus environment. Good campus design can directly influence behavior and promote student learning.

The interaction between customers and organizations is an important determinant of brand value creation [46]. Through the interaction between organizations and customers, and through the previous brand experience, brand value can be created, and CSR is an important component of value and value creation. Kyong Sik Sung and Seoki Lee [47] also stated in their research on customer brand co-creation behavior through CSR interaction that CSR activities on social media and customer experience and interaction may affect customers' emotional connections between brands.

In addition, taking Chunghwa Telecom, a telecommunications company in Taiwan, as an example, to meet the needs of visually impaired individuals, they have launched a "Voice Portable Assistant" app, which provides voice recognition, book reading, and visual assistance. In addition to enhancing the user experience, and simplifying and user-friendly interfaces, the motivation behind the design is to bring convenience to the lives of visually impaired individuals [48]; to enhance social care, it is provided free of charge for visually impaired individuals to download and use, and is a practice of CSR through optimizing the user experience. Therefore, when assistive technology users receive a better user experience through ATR center services, their perception of CSR will also be higher. It is hypothesized that user experience will have a significant positive impact on CSR, as stated in hypothesis H3:

Hypothesis 3 (H3). *User experience will have a significant positive impact on CSR.*

2.6. User Satisfaction

Customer satisfaction can affect the loyalty and reputation of an organization or brand, and customer satisfaction is also a strategic and key factor influencing post-purchase behavior [49]. Some studies involving customer satisfaction have shown that product and service quality can improve customer satisfaction [50].

Some researchers believe that service convenience is an important source for maintaining competitive advantages and is also a very important factor in consumer behavior. Throughout the entire user experience, service convenience will affect customers' perception of fairness [51]. In addition, research has also indicated that reducing waiting times and labor costs for customers during service can improve satisfaction and obtain higher perceived quality [52].

Furthermore, a study on customer loyalty in low-cost fitness centers in Spain found positive correlations between perceived quality, service convenience, perceived value, customer satisfaction, and customer loyalty based on the results of surveys from three low-cost fitness centers [53]. Therefore, the above-mentioned related studies support the idea that service convenience will help improve service satisfaction.

Therefore, if the convenience of using ATR center services increases, user satisfaction will also increase relative to it. It is hypothesized that service convenience will have a positive and significant effect on user satisfaction, as presented in research hypothesis H4.

Hypothesis 4 (H4). *Service convenience will have a significant positive impact on user satisfaction.*

The brand of a company or organization is an intangible asset and is also known as the driving force for new economic growth. Developing a brand helps to cultivate customers' or service users' awareness of its services or products, thereby enhancing market share or loyalty. There is a positive correlation between customer satisfaction and loyalty [54]. Satisfied consumers usually continue to use the same brand in the future, indicating that brand loyalty is positively influenced by brand satisfaction [55]. In general, if value co-creation can be effectively developed in the interaction with customers [56] and brand satisfaction can be established through experiential means, it represents the result of consumers' experience with the brand [57].

In a study [58] on the relationship between service quality and customer satisfaction in the Jordanian banking industry, service quality was evaluated in terms of access, financial

aspects, and employee competences, and the results showed that service quality positively affects customer satisfaction, indicating the importance of service quality in improving customer satisfaction in banks. When evaluating service quality, “tangibles” such as the physical service facilities, signage, decor, manuals, and the appearance of employees are important indicators [37]. Therefore, the service environment is an important component of quality, customer’s satisfaction with the service environment can affect the overall evaluation of the service, and the perceived attractiveness of the environment can also affect service satisfaction [59]. In addition, in a study [60] on user satisfaction with library space renovation in three universities in Wuhan, it was found that service facility availability was the most critical factor affecting service space satisfaction, while the quality of interior design and physical environment elements also significantly affected students’ satisfaction with service space renovation and configuration optimization.

Therefore, if users have a better perception of the brand image and spatial environment of the ATR center and other related factors, their satisfaction will also increase accordingly. It is inferred that service quality will significantly and positively affect user satisfaction and research hypothesis H5 is proposed as follows:

Hypothesis 5 (H5). *Service quality will have a significant positive impact on user satisfaction.*

Customer service satisfaction is usually the evaluation of customers’ satisfaction with specific services. Studies on the introduction of artificial intelligence (AI) chatbots in service provision have shown that incorporating experiences into services and strengthening the interaction process with AI robots will enhance customers’ perceived quality of the overall experience. The results also found a positive relationship between user experience and overall service satisfaction [61]. User experience focuses on emotional factors as it adopts a human-centric perspective. User satisfaction is achieved through understanding user psychological states (such as preferences, needs, or motivations), design representations (such as complexity or functionality), and the environmental context of interactions (such as social environment or the meaning represented by the activity itself) [62]. In the well-known satisfaction perception model, the author proposed five variables, including user expectations, user experience, perceived value, satisfaction, and brand image. It is believed that the better the service experience provided to users and the establishment of one’s good reputation, the higher the perceived value of the user’s psychological experience and the higher the overall satisfaction [63]. Taking blog marketing as an example, research has found that customer experience and perceived value directly affect satisfaction and willingness to continue using the blog. Furthermore, through the mediation of satisfaction and continuing willingness, they also indirectly affect the sustainable social relationship between customers and blogs [64].

Therefore, it is inferred that the better the service experience provided by the ATR center, the higher the satisfaction of users will be. It is hypothesized that user experience will significantly and positively affect user satisfaction, and research hypothesis H6 is proposed as follows:

Hypothesis 6 (H6). *User experience will have a significant positive impact on user satisfaction.*

Martínez and Rodríguez del Bosque [65] found that in their study on Spanish hotel industry consumers’ perceptions of CSR and its impact on customer loyalty, customers’ perception of a company’s CSR indirectly affects loyalty through trust, identification, and satisfaction. Research [66] on the dining intentions of casual restaurant customers in the U.S. and China shows that customer satisfaction is relatively higher when restaurants take health-related corporate social responsibility (CSR) actions. In addition, a content analysis study of CSR reports from 65 US companies by Rivera, Bigne, and Curras-Perez [67] indicated that employee education and training initiatives related to CSR policies are positively related to customer satisfaction, as are policies related to environmental issues. They also encourage companies to undertake CSR initiatives in collaboration with customers

to optimize the effectiveness of CSR programs and enhance customers' social satisfaction. Yang and Stohl [68] also suggest that companies' CSR practices are related to consumer behavior and financial performance through reputation mechanisms. González-Rodríguez et al. [69], in their study on the relationship between CSR, reputation, and performance in the Chinese hotel industry, found that CSR practices that enhance reputation have a positive impact on both direct and indirect measures of corporate performance, with non-financial performance indicators such as customer satisfaction and competitive position having a greater impact than financial performance indicators.

Therefore, the higher the perceived level of CSR of an ATR center, the higher the level of service satisfaction among users. This study proposes the hypothesis that CSR has a positive significant impact on user satisfaction, as follows:

Hypothesis 7 (H7). *CSR will have a positive significant impact on user satisfaction.*

2.7. Mediating Effects

In statistical research, if a mediator variable (also known as an intervening or process variable) is necessary between the independent and dependent variables to produce a result, it is referred to as the mediating effect [70]. This means that the independent variable influences the mediator variable, which in turn affects the dependent variable [71].

Based on the literature, service convenience, service quality, and user experience all have a positive impact on CSR, which in turn has a positive impact on satisfaction. Rivera et al. [67] found that if consumers respond positively to a brand's CSR advocacy through a specific relationship, it can increase satisfaction and strengthen their brand attitude in the social dimension, and CSR plays an important mediating role in the impact of the brand on satisfaction.

According to the studies conducted by scholars such as Kumar, Mackey, and Casado-Díaz [25,32,33], it has been found that service convenience has a positive impact on Corporate Social Responsibility (CSR). Research has also shown that customers are more willing to patronize service-oriented industries that demonstrate social responsibility, indicating a positive influence of CSR on user satisfaction. Therefore, CSR plays a mediating role between service convenience and user satisfaction. The following research hypothesis is inferred:

Hypothesis 8 (H8). *The convenience of ATR center services has a significant positive impact on user satisfaction through CSR.*

Additionally, Chang [16] and Diallo [38] have demonstrated the positive impact of service quality on CSR. González et al. [69], in their study on the hotel industry, concluded that CSR has a stronger influence on non-financial performance indicators, such as customer satisfaction. Thus, this study posits that service quality has a positive impact on user satisfaction through CSR.

Hypothesis 9 (H9). *The intensity of service quality perception has a significant positive impact on user satisfaction through CSR.*

The study by HUA [48] confirmed that user experience has a positive impact on CSR. Additionally, research on the relationship between health-related CSR initiatives in restaurants and customer satisfaction [66] demonstrated that CSR measures positively influence customer satisfaction. Therefore, it can be inferred from these findings that user experience affects user satisfaction through the mediating role of CSR.

Hypothesis 10 (H10). *The intensity of user experience perception of ATR center services has a significant positive impact on user satisfaction through CSR.*

This study aims to explore the perceptions of assistive device users of the services provided by the ATR center and investigate the factors that affect their satisfaction. Based on the literature review, the research framework in Figure 4 was proposed, with “service convenience”, “service quality”, “user experience”, and “CSR” as independent variables; “CSR” also played the role of a mediating variable. “User satisfaction” was the dependent variable, and the research aimed to understand the impact of satisfaction of assistive device users who received services from the ATR center commissioned by the government.

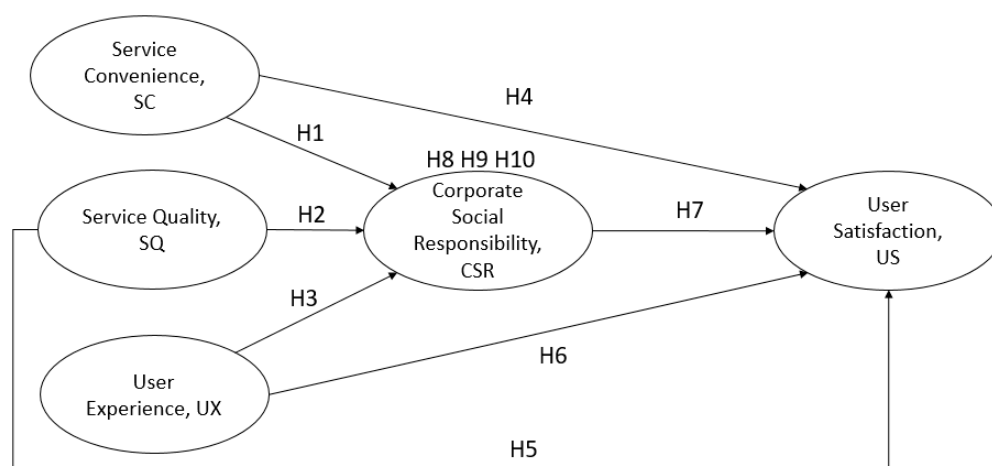


Figure 4. Research Framework.

3. Methodology

3.1. Research Subjects and Data Collection

This study investigates the satisfaction of assistive device users with the services provided by ATR centers. Therefore, the study subjects are all individuals who have received assistive device services. The study used a questionnaire survey method, with ATR center staff and volunteers assisting in the distribution of paper or online electronic questionnaires. Data were collected through relevant groups, civil society organizations, hospitals, and assistive device manufacturers in all locations related to assistive device services in Yunlin County. The questionnaire distribution period was from 13 December 2022 to 28 February 2023. A total of 543 questionnaires were collected, and after removing invalid questionnaires, a total of 532 valid questionnaires were obtained. According to the sample size formula and referring to The Survey System website (<https://www.surveysystem.com/sscalc.htm>, accessed on 6 February 2023.), the required sample size for the overall population of Taiwan is 384 at a 95% confidence level and a 5% margin of error.

3.2. Research Variables

This study includes the following research variables: user information, service convenience, service quality, user experience, CSR, and user satisfaction. The operational definitions of these variables are explained as follows:

3.2.1. User Basic Information

This study mainly investigates the satisfaction of assistive device users with the services provided by the ATR center. Therefore, the first part of the questionnaire will gather their basic information, including gender, age, types of welfare, types of disability, level of disability, types of services received from the ATR center, types of service locations, and the identity of the respondent, a total of 8 items.

1. Gender: Male, female, 2 items.
2. Age: Under 10 years old, 11–20 years old, 21–30 years old, 31–40 years old, 41–50 years old, 51–60 years old, 61–70 years old, 71–80 years old, and 81 years old and above, 9 items in total.

3. Eligibility for welfare benefits: people with disabilities, long-term care service recipients, none of the above, 3 items.
4. Types of disabilities: none, and 9 items from the 1st to the 8th category.
5. The severity of disabilities: none, and 5 items: mild, moderate, severe, extremely severe.
6. Types of services received from the ATR center: consultation, assessment, subsidy application, device maintenance, device borrowing, device recycling, device use training, 7 items in total.
7. Types of assistive device service locations in the county: ATR center, assistive device service station, and assistive device service convenience station.
8. Respondent identity: assistive device user, caregiver or family member, friend, other, 4 items.

3.2.2. Latent Variables Measurement

The questions are measured using a Likert seven-point scale, ranging from “strongly disagree” (1), “disagree” (2), “somewhat disagree” (3), “neutral” (4), “somewhat agree” (5), “agree” (6), and “strongly agree” (7). The higher the score given by the respondents, the more agreement they have towards the research variables. The questionnaire was designed and reviewed by experts and scholars before distribution, and the design of each aspect is explained as follows:

3.2.3. Service Convenience

The construct of service convenience in this study was referenced from Chang and Huang’s [16] study on the reputation of ATR centers. The item “There are many channels (such as website, phone, and in-person) to learn about the services of the ATR center” was revised, and a total of 6 questions were designed, as shown in Table 1.

Table 1. Service convenience items.

Service Convenience	References
1. The services provided by the ATR center meet my needs.	Chang and Huang [16]
2. The ATR center supports multiple channels for obtaining information, such as websites, telephone, Facebook, and official LINE.	
3. The opening hours of the ATR center are convenient for me.	
4. The location of the ATR center (or service point) is very convenient.	
5. The information provided by the ATR center makes it easier for me to choose assistive devices.	
6. The services provided by the ATR center are convenient for me.	

3.2.4. Service Quality

This study referred to the research questions on factors affecting tourists’ willingness to revisit by Abbasi, Kumaravelu, Goh, and Singh [72] and the research questions on relevant factors of ATR centers by Chang and Huang [16] for the service quality section. A total of 5 questions were designed, as shown in Table 2.

Table 2. Service quality items.

Service Quality	References
1. The internal space planning of the service area in the ATR center is well-designed.	Abbasi, Kumaravelu, Goh, and Singh [72] Chang and Huang [16]
2. The overall equipment in the ATR center meets my service needs.	
3. The service provided by the ATR center gives me a sense of reliability.	
4. The service provided by the ATR center gives me a sense of professionalism.	
5. The service provided by the ATR center gives me a sense of friendliness.	

3.2.5. User Experience

This questionnaire references Xing-yuan, Li, and Wei [73] for the development of brand trust survey items, specifically the item “The system’s capabilities meet my requirements”, and Shanta Banik and Yongqiang Gao’s [74] research on hedonic factors for physical retail customers, with items such as “The process of obtaining products in this physical retail store is quick”, “I feel good in this physical retail store”, “The overall lighting in the physical retail store is pleasant”, and “The employees in this physical retail store respect me.” The questionnaire contains 5 items in total, as listed in Table 3.

Table 3. User experience items.

User Experience	References
1. The professional ability of the service staff at the ATR center meets my requirements.	Xing-yuan, Li, and Wei [73] Banik and Gao, [74]
2. The process of obtaining relevant services at the ATR center is fast.	
3. The ATR center makes me feel good.	
4. The overall lighting at the ATR center is pleasant.	
5. The staff at the ATR center will respect me.	

3.2.6. Corporate Social Responsibility (CSR)

This study referred to the dimensions of CSR from Mohd Suki’s [75] study on the determinants of Malaysian consumers’ willingness to purchase organic vegetables. The items “The company contributes to the development of the community”, “The company is committed to protecting the environment”, and “The company contributes to national development” were modified. In addition, items from Islam et al.’s [76] study on the impact of CSR on customer loyalty, such as “Is your company considered trustworthy”, and items from Mohezar et al.’s [77] study on self-education to improve food safety knowledge were also considered. A total of five questions were designed, as shown in Table 4.

Table 4. Corporate social responsibility (CSR) items.

Corporate Social Responsibility (CSR)	References
1. The ATR center contributes to the development of the community.	Mohd Suki [75] Islam et al. [76] Mohezar et al. [77]
2. The ATR center is committed to protecting the environment (e.g., through assistive technology recycling services).	
3. The existence of the ATR center contributes to the development of the country.	
4. The ATR center is considered trustworthy.	
5. The ATR center provides professional consultations to users, improving their knowledge of assistive technology use.	

3.2.7. User Satisfaction

This study referred to the satisfaction dimension and modified the questionnaire based on the research of Chang et al. [78], which encompassed items such as “The functions provided by PACS overall meet my needs” and “Overall, using PACS can provide me with satisfactory support”. In addition, two items from Tseng and Li’s [79] study on library electronic resource integration system evaluation were included: “I will use the electronic resource integration system again in the future to search for information” and “After using the electronic resource integration system, I will recommend it to others”. The item “Using the mobile repair system is the right choice” from Yang and Hung’s [80] research was also included. A total of five items were designed, as shown in Table 5.

Table 5. User satisfaction items.

User Satisfaction	References
1. The services provided by the ATR center meet my overall needs.	Chang et al. [78];
2. The support provided by the ATR center is satisfactory to me.	Fan-ChuanTseng,
3. I will use the services of the ATR center again if I need to in the future.	Tsung-Han Li [79];
4. I would recommend the services of the ATR center to others.	Chih-Chin Yang and
5. Seeking the services of the ATR center is the right choice.	Chen-Ming Hung [80]

3.3. Data Analysis

This study will be conducted in three parts: descriptive statistical analysis, measurement model validation, and structural equation model analysis. Descriptive statistical analysis includes two parts: first, calculating the distribution of demographic data to understand the sample characteristics, where some research variables are nominal scales such as gender, identity, or disability level, to examine the sample's representativeness of the population. The second part is the mean and standard deviation of each construct item, where the Likert seven-point scale used in the questionnaire is continuous, and the results will be validated for normal distribution. At the same time, this study verifies the construct's convergent validity through confirmatory factor analysis and also tests the discriminant validity [81] to validate the measurement model. Finally, this study uses structural equation models (SEM) to verify research hypotheses, performs a model fit test, and analyzes the path analysis and mediation effects through the statistical software AMOS (SPSS Inc., Chicago, IL, USA) to conclude.

4. Results

4.1. Sample Basic Information Analysis

The analysis results of the five basic information categories including gender, welfare qualification, disability category, disability level, and age are shown in Table 6. Among the respondents, 296 (55.6%) were female; 219 (41.2%) had no disability qualification or were not long-term care service users; 266 (50%) did not have a disability category; 266 (50%) did not have a disability level; and 109 (20.5%) were aged between 51–60 years old.

Table 6. Basic information analysis.

Category	Items	No.	Percentage	Category	Items	No.	Percentage
Gender	Male	236	44.4	Disability level	Mild	55	10.3
	Female	296	55.6		Moderate	88	16.5
BenefitEligibility	People with disabilities	204	38.3		Severe	102	19.2
	Long-term care service recipients	109	20.5		Extremely severe	21	3.9
	None of the above	219	41.2		None	266	50
Types of disabilities	1st	38	7.1	Age	Under 10 years old	3	0.6
	2nd	26	4.9		11–20 years old	4	0.8
	3rd	16	3		21–30 years old	34	6.4
	4th	25	4.7		31–40 years old	63	11.8
	5th	8	1.5		41–50 years old	90	16.9
	6th	28	5.3		51–60 years old	109	20.5
	7th	101	19		61–70 years old	69	13
	8th	4	0.8		71–80 years old	64	12
	Multiple barriers	20	3.8		81 years old and above	96	18
	None	266	50				

4.2. Common Method Variance Testing

To examine the presence of common method variance (CMV), this study adopted the suggestion by Podsakoff and Organ [82] and employed Harman's [83] single-factor test. Harman's single-factor test was conducted using the SPSS software through factor analysis. The criterion for determining the presence of CMV is that the first factor's squared loadings cumulatively explain less than 50% of the variance. In this study, the cumulative percentage of variance explained by the first factor's squared loadings was 18.967%, which meets the criterion.

4.3. Convergent Validity

The measurement model employed confirmatory factor analysis to conduct analyses on standardized factor loadings, composite reliability, and average variance extracted. Hair, Anderson, Tatham, and Black [84], Nunnally and Bernstein [85], and Fornell and Larcker [86] suggested the following criteria for convergent validity:

1. Standardized factor loadings above 0.50 to confirm the reliability of each observation item;
2. Composite reliability (CR) above 0.60 to test the reliability of the construct;
3. The average variance extracted (AVE) is above 0.50.

As shown in Table 7, the standardized factor loadings ranged from 0.789 to 0.959, all above 0.5, and even higher than 0.7. The composite reliability of the research constructs ranged from 0.950 to 0.963, all exceeding 0.7, meeting the above criteria and indicating good internal consistency of the research constructs. Finally, the average variance extracted values were between 0.759 and 0.840, all above 0.5, meeting the standards proposed by Fornell and Hair et al. [84,86], indicating good convergent validity of the research constructs.

Table 7. Convergent validity analysis.

Construct	Item	Factor Loading (Item)	Composite Reliability	Average Variance Extracted (AVE)
SC	SC1	0.922	0.950	0.759
	SC2	0.888		
	SC3	0.835		
	SC4	0.789		
	SC5	0.902		
	SC6	0.900		
SQ	SQ1	0.900	0.963	0.840
	SQ2	0.918		
	SQ3	0.924		
	SQ4	0.930		
	SQ5	0.910		
UX	UX1	0.909	0.957	0.816
	UX2	0.921		
	UX3	0.906		
	UX4	0.905		
	UX5	0.876		
CSR	CSR1	0.832	0.957	0.817
	CSR2	0.885		
	CSR3	0.899		
	CSR4	0.940		
	CSR5	0.959		
US	US1	0.911	0.958	0.819
	US2	0.914		
	US3	0.898		
	US4	0.895		
	US5	0.908		

Note: service convenience = SC; service quality = SQ; user experience = UX; corporate social responsibility = CSR; user satisfaction = US.

4.4. Discriminant Validity

Fornell and Larcker [86] suggested that discriminant validity should consider both convergent validity and the interrelatedness of constructs. Therefore, this study used the more rigorous AVE method to analyze discriminant validity. The results (Table 8) show that the square roots of the AVEs for each construct are greater than the correlation coefficients between constructs, indicating that the model in this study has good discriminant validity.

Table 8. Discriminant validity analysis.

	SC	SQ	UX	CSR	US
SC	0.871				
SQ	0.638	0.917			
UX	0.488	0.586	0.903		
CSR	0.517	0.637	0.660	0.904	
US	0.641	0.654	0.589	0.689	0.905

Note: The items on the diagonal in bold represent the square roots of the AVE; off-diagonal elements are the correlation estimates. Service convenience = SC; service quality = SQ; user experience = UX; corporate social responsibility = CSR; user satisfaction = US. The bold numbers in the diagonal direction represent the square roots of AVEs.

4.5. Model Fit

This study referred to Jackson, Gillasp, and Purc-Stephenson [87] for the model fit indices of 194 international academic journal articles (Social Science Citation Index, SSCI) as a blueprint for analyzing model fit, and adopted the 9 most widely used fit indices. At the same time, because if the SEM sample size is greater than 200, it is easy to cause the chi-square value to be too large, leading to poor model fit, so the Bootstrapping method was used to correct the model fit [88]. The corrected model fit results are shown in Table 9, which indicates that all the fit indices of this study passed, and the results of this study were an acceptable model.

Table 9. Model fit indices.

Fit Indices	Acceptable Range	Criteria	Model Fit Assessment
Chi-square		996.559	
Degree of freedom		289	
CFI	>0.9	0.969	Pass
RMSEA	<0.08	0.060	Pass
TLI	>0.9	0.965	Pass
GFI	>0.9	0.953	Pass
NFI	>0.9	0.953	Pass
χ^2/df	<3	2.889	Pass
AGFI	>0.8	0.940	Pass

4.6. Hypothesis Testing

The results of path coefficients are shown in Table 10:

Hypothesis 1 (H1). *The non-standardized regression coefficient of service convenience (SC) on corporate social responsibility (CSR) is 0.086, reaching a significant level (t -value = 2.465, p -value = 0.014). Therefore, hypothesis 1 of this study, that service convenience (SC) has a significant impact on corporate social responsibility (CSR), is supported.*

Hypothesis 2 (H2). *The non-standardized regression coefficient of service quality (SQ) on corporate social responsibility (CSR) is 0.230, reaching a significant level (t -value = 6.810, p -value = 0.000). Therefore, Hypothesis 2 of this study, that service quality (SQ) has a significant impact on corporate social responsibility (CSR), is supported.*

Hypothesis 3 (H3). *The non-standardized regression coefficient of user experience (UX) on corporate social responsibility (CSR) is 0.302, reaching a significant level (t -value = 9.765, p -value = 0.000). Therefore, Hypothesis 3 of this study, that user experience (UX) has a significant impact on corporate social responsibility (CSR), is supported.*

Hypothesis 4 (H4). *The non-standardized regression coefficient of service convenience (SC) on user satisfaction (US) is 0.351, which reaches a significant level (t -value = 7.113, p -value = 0.000). Therefore, Hypothesis 4, that service convenience (SC) has a significant impact on user satisfaction (US), is supported and accepted.*

Hypothesis 5 (H5). *The non-standardized regression coefficient of service quality (SQ) on user satisfaction (US) is 0.190, which reaches a significant level (t -value = 3.898, p -value = 0.000). Therefore, Hypothesis 5, that service quality (SQ) has a significant impact on user satisfaction (US), is supported and accepted.*

Hypothesis 6 (H6). *The non-standardized regression coefficient of user experience (UX) on user satisfaction (US) is 0.119, which reaches a significant level (t -value = 2.588, p -value = 0.010). Therefore, Hypothesis 6, that user experience (UX) has a significant impact on user satisfaction (US), is supported and accepted.*

Hypothesis 7 (H7). *The non-standardized regression coefficient of corporate social responsibility (CSR) on user satisfaction (US) is 0.527, which reaches a significant level (t -value = 7.639, p -value = 0.000). Therefore, Hypothesis 7, that corporate social responsibility (CSR) has a significant impact on user satisfaction (US), is supported and accepted.*

Table 10. Empirical results for research hypotheses.

(IV)	(DV)	Unstd.	S.E.	t -Value	p -Value	Std.	R ²
SC	CSR	0.086	0.035	2.465	0.014	0.106	0.538
SQ		0.230	0.034	6.810	0.000	0.325	
UX		0.302	0.031	9.765	0.000	0.418	
CSR	US	0.527	0.069	7.639	0.000	0.352	0.611
SC		0.351	0.049	7.113	0.000	0.291	
UX		0.119	0.046	2.588	0.010	0.110	
SQ		0.190	0.049	3.898	0.000	0.179	

Note: IV = independent variable; DV = dependent variable; Unstd. = unstandardized regression coefficient; S.E. = standardized error; Std. = standardized regression coefficient; R² = coefficient of determination; service convenience = SC; service quality = SQ; user experience = UX; corporate social responsibility = CSR; user satisfaction = US.

The study results (Figure 5) support the research hypotheses of this model. The explanatory power of service convenience, service quality, and user experience for the variation in CSR is 53.8%. The explanatory power of service convenience, service quality, user experience, and CSR for user satisfaction is 61.1%.

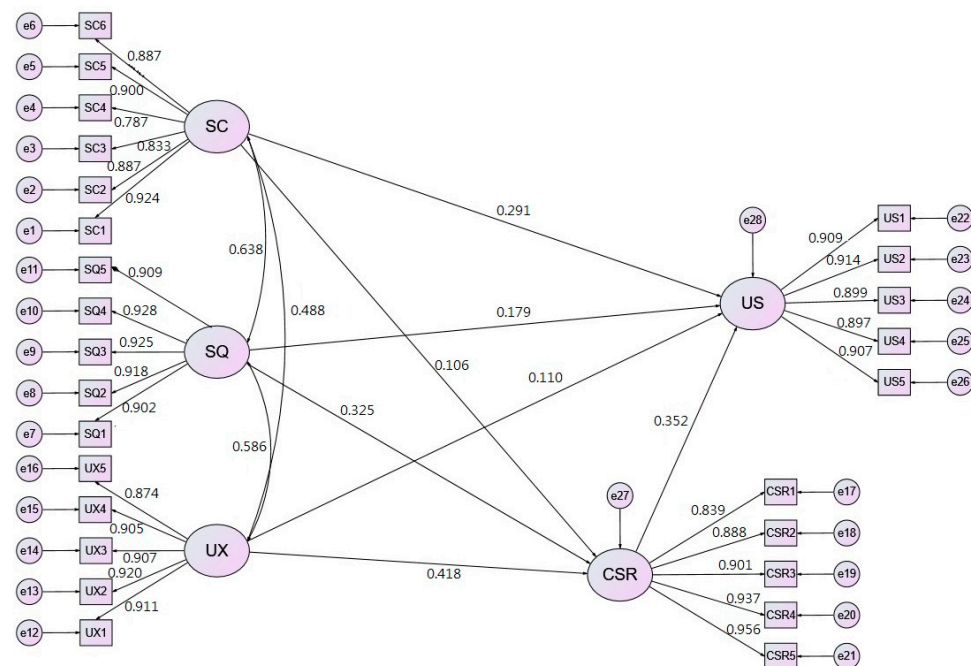


Figure 5. SEM statistical model. Note: service convenience = SC; service quality = SQ; user experience = UX; corporate social responsibility = CSR; user satisfaction = US.

4.7. Mediating Effects

The results of the indirect effect analysis of the following mediation models (Table 11) are as follows:

Table 11. Mediation model indirect effect analysis.

Indirect Effect	Point Estimate	p-Value	Bias-Corrected 95%	
			Lower Bound	Upper Bound
SC→CSR→US	0.045	0.333	−0.048	0.231
SQ→CSR→US	0.121	0.046	0.002	0.386
UX→CSR→US	0.159	0.007	0.052	0.438

Note: service convenience = SC; service quality = SQ; user experience = UX; corporate social responsibility = CSR; user satisfaction = US.

Hypothesis 8 (H8). For the indirect effect of service convenience (SC)→corporate social responsibility (CSR)→user satisfaction (US), the *p*-value is greater than 0.05 and the confidence interval includes 0 [−0.048, 0.231], indicating that the indirect effect is not significant.

Hypothesis 9 (H9). For the indirect effect of service quality (SQ)→corporate social responsibility (CSR)→user satisfaction (US), the *p*-value is less than 0.05 and the confidence interval does not include 0 [0.002, 0.386], indicating that the indirect effect is significant.

Hypothesis 10 (H10). For the indirect effect of user experience (UX)→corporate social responsibility (CSR)→user satisfaction (US), the *p*-value is less than 0.05 and the confidence interval does not include 0 [0.052, 0.438], indicating that the indirect effect is significant.

5. Conclusions and Discussion

This study mainly explores the perceptions of assistive device users in Taiwan (including users and caregivers) of the services provided by ATR centers, to understand their impact on overall service satisfaction. This serves as a reference for the government's promotion of sustainable assistive device services for people with disabilities and the elderly. After reviewing relevant literature, variables such as “service convenience”, “service

quality”, and “user experience” were selected as independent variables, while “user satisfaction” was the dependent variable. CSR was used as a mediator variable, and a research framework and related hypotheses were proposed.

5.1. Academic Contribution

Taiwan has entered an aging society accompanied by a large demand for assistive devices, so the government actively promotes convenient assistive services. In the process of overall service delivery, in addition to hiring a large number of professionals, the government is actively improving service quality items such as space size, display equipment, and optimizing service processes. It also hopes to enhance the customer service experience. In addition, to protect the environment and promote sustainable services, the ATR center also recycles and reuses second-hand assistive devices. As there is little exploration of the factors affecting the acceptance of ATR center services, it is hoped that by understanding users’ feelings about ATR center services, we can understand the overall satisfaction of assistive device users with the ATR center.

Therefore, this study attempts to explore the impact of service convenience, service quality, user experience, and CSR on satisfaction with ATR centers. The results are as follows:

5.1.1. The Impact of Service Convenience, Service Quality, and User Experience on CSR

From the research results, it can be seen that service convenience, service quality, and user experience all have a significant positive impact on CSR, which is similar to previous research results [33,40,48]. of the idea of “Service convenience” could be, for example, thinking that ATR center services can meet assistive technology-related needs, and thinking that ATR center services are very convenient. In the “service quality” dimension, this could mean thinking that the service provided is reliable, professional, and friendly. In terms of “user experience”, for example thinking that ATR center employees will respect users, the overall lighting of the ATR center is pleasant, and giving people a good feeling, the average score is above 6.6; especially in topics related to personnel interaction and personal feelings after receiving services, the scores are higher than those related to hardware equipment, information provision, or location convenience, etc. All of these show that whether it is service convenience, service quality, or user experience, if the service provider can provide more service interaction content for assistive technology users or caregivers, and care about the user’s feelings, it will have good effects on improving the overall service, and at the same time, there is a consistent perception of CSR in ATR centers.

The results of the path analysis on the impact of user experience on CSR show that the perceived importance of CSR in ATR centers by assistive technology users is extremely high and even higher than service convenience. This also indicates that assistive technology users have a greater sense of quality due to their service experience, and their perception of the feelings of vulnerable groups such as people with disabilities or long-term care recipients is particularly evident. Service quality also brings a sense of reliability, responsiveness, and empathy, which are closely related to the spirit of CSR conveyed by ATR centers. Therefore, a responsible organizational image is more important for ATR centers than information or location convenience in terms of service acquisition.

In terms of the impact of service convenience, service quality, and user experience on user satisfaction with CSR, the research findings show that all three factors have a positive impact on user satisfaction with CSR. This result is similar to previous research results (Bielen and Demoulin, 2007 [59]; García-Fernández et al., 2018 [53]; Rivera et al., 2016 [67]; Shubai and Ming-Hsun Chiang, 2022 [63]). Among them, CSR has a higher level of influence than other factors such as service convenience or user experience, indicating that ATR centers can provide vulnerable groups with professional assistive technology information and sustainable services for national development and environmental protection, which is highly valued.

5.1.2. The Impact of Service Convenience, Service Quality, User Experience, and CSR on User Satisfaction

According to the research results, service convenience, service quality, user experience, and CSR all have a positive impact on user satisfaction. This result is similar to previous studies [53,59,63,67]. Among them, CSR has a higher impact than other factors such as service convenience or user experience, indicating that the ATR center can provide professional assistive device information for vulnerable groups and provide sustainable services for national development and environmental protection, which is highly valued by people.

The research data also show that when users need assistive devices, they are very satisfied with seeking services from the ATR center and are willing to recommend the relevant services to others, indicating a very high level of satisfaction with the services provided by the center. In addition to the perceived impact of CSR on satisfaction, service convenience is also highly valued by assistive device users and affects their perception of satisfaction with the center's services. Therefore, in recent years, Taiwan has actively established various types of service points with convenience in various places, which can fully meet the expectations of assistive device users. At the same time, users have high expectations regarding the internal activity space planning and the overall equipment alignment with their needs in the service quality dimension. In the user experience dimension, users have a positive perception of the overall space lighting and spatial experience, which represents the importance that assistive device users place on the service space when accessing services.

Interestingly, the user experience of ATR center services for assistive device users has the most significant impact on CSR, but its impact on user satisfaction is the lowest, even lower than service quality. This suggests that, compared to other factors, users place less emphasis on their experience and prioritize convenience in accessing services, which may be since users generally come to the ATR center only a few times (once or twice) and stay for a relatively short time (about 30–60 min), leading to less emphasis on the user experience.

5.1.3. The Impact of Service Convenience, Service Quality, and User Experience on CSR and User Satisfaction in ATR Centers

Finally, the research results indicate that both service quality and user experience influence CSR, and CSR has a significant positive effect on user satisfaction. This means that the service quality and user experience of ATR centers indirectly affect user satisfaction, and CSR has a mediating effect. This result is similar to previous research by [67]. The initial hypothesis was that the higher the perceived convenience of ATR centers by users, the easier it would be to positively impact CSR, indirectly leading to an increase in satisfaction. However, this was not established, possibly because assistive technology users only come to inquire about assistive devices when they have urgent or necessary needs, and therefore do not care about convenience or do not perceive the CSR spirit of the ATR center.

Therefore, regardless of whether the service is convenient or not, due to the unique and exclusive position of the ATR center commissioned by the government, when people need to apply for assistive technology or evaluate their needs, they must come to the ATR center. Thus, it does not particularly affect their perception of whether the ATR center has CSR but indirectly affects their satisfaction. However, if the service quality of the ATR center is perceived to be reliable, such as well-planned internal activity spaces or equipment that meet requirements, and if the center can meet users' demands and make them feel respected, it enables assistive technology users to perceive CSR, a responsible and reliable organizational spirit, and thus positively affects their satisfaction with the center's services. Therefore, when providing assistive technology services, service personnel should strengthen their empathy, professionalism, and service attitudes, and improve the ATR center's equipment and lighting, while allowing people to understand the relevant services provided to people with disabilities and the elderly, how efforts are being made

for environmental protection and elderly care, and allowing users to receive professional advice, to enhance overall service satisfaction.

5.2. Practical Recommendations

Taiwan is moving towards a super-aged society, and with the shortage of caregivers and a significant increase in the population's need for assistive devices, providing a comprehensive assistive technology service system has become an important issue. The World Health Organization (WHO) in its "Global Strategy and Plan of Action on Ageing and Health" [1] believes that a friendly environment and adequate support can help the elderly continue to participate in society and maintain their physical health.

Therefore, this study focused on the population in Yunlin County in the context of an aging society to explore their perceptions of ATR center services in the context of caregiver shortages and relatively limited resources, aiming to understand the issues related to the government's promotion of an integrated assistive technology service system and the direction for future adjustments. Based on the results obtained from this study, four directions are recommended to promote future ATR center user acceptance and service satisfaction:

1. Enhancing architectural space design to improve user experience

The overall service experience of the assistive technology resources center should begin with the interaction between the center and the users, starting from pre-service, through the actual service stage, and even in the post-service stage. It is essential to ensure that users have a pleasant experience throughout the service process. The architectural environment experienced by users is the most direct and intuitive aspect of their service experience. This includes factors such as spatial layout, lighting brightness, facility arrangement and display, as well as the optimization of service space design and configuration. All these elements contribute to providing users with a positive spatial environment and innovative service satisfaction, further facilitating the improvement of overall service quality and user experience.

2. Pay more attention to the psychological feelings of the users when providing services

According to the research results, it was found that in addition to the positive impact of service quality and user experience on improving satisfaction with the ATR center, the responses regarding the psychological feelings of assistive device users when receiving services were particularly evident in some aspects of the two dimensions. For example, whether the ATR center makes people feel reliable or professional, or whether they are respected when receiving services. Therefore, when the ATR center provides services, in addition to meeting the assistive device needs of users, more empathy and care should be given to the service recipients, and related questions about disability care should be answered to solve the troubles and pressures of caregivers or disabled persons, which can also increase the trust in the ATR center. At the same time, paying more attention to service details can also enhance the user experience and service quality, which can further increase user satisfaction.

3. Improve the convenience of assistive technology services

This study found that if the service convenience is improved, it not only has a positive impact on the perception of CSR but also directly affects user satisfaction. Therefore, many service locations have been set up in various counties and cities in Taiwan to increase convenience for assistive device users, reducing transportation restrictions for those with mobility difficulties. In addition, it is recommended that ATR centers provide relevant information through multiple channels, such as using communication software to make service appointments or inquiries or providing sufficient information on their website to increase service convenience. Furthermore, since elderly or physically challenged individuals often require assistance from others for their daily living or outings, increasing weekend or nighttime service hours can also improve overall satisfaction.

4. Value the CSR performance of ATR centers

The purpose of ATR centers is to meet the needs of vulnerable populations for related assistive devices and provide professional assistive technology services, rooted in concerns for human rights and welfare. It is important to incorporate environmental, social, and ethical responsibilities into the operation strategies of ATR centers, which can effectively enhance the value to all stakeholders. In addition to serving people with disabilities in their daily lives, ATR centers also provide assistive technology services for special education during the student stage and in the workplace for people with disabilities or older workers. Furthermore, the frequent problems of waste or idleness associated with assistive technology use can be addressed through the diversified reuse of assistive devices to achieve environmental protection goals, enhancing the value of assistive devices themselves, and helping aging societies achieve their sustainable development goals. Improving CSR performance can indirectly affect user satisfaction by enhancing the quality of assistive technology services and improving user experience.

5.3. Limitations and Future Developments

In the past, there has been a lack of research on the subjective experiences of users receiving services from ATR centers, particularly among the predominantly elderly and disabled population who rely on assistive devices. These individuals often face challenges in accessing services due to their limited physical capabilities, which further complicates their ability to receive the necessary support. From this study, it is evident that the user experience in assistive technology resource centers (ATR) positively influences user satisfaction. Therefore, in the future, there should be further investigation into the experiential aspects related to the built environment during the service process, as well as their impact on users' well-being and perception of interaction. This includes exploring service facility availability, the quality of interior design, and physical environment elements. Conducting research on the different experiences of environmental perception may provide more specific recommendations for optimizing service space transformation and configuration.

This study not only discusses issues related to service convenience, service quality, and user experience for assistive technology users, but also discusses the issue of CSR of ATR centers. Since the Yunlin County ATR center has been established for nearly 20 years and has a good reputation locally, the impact of the above-mentioned constructs on user satisfaction in this study may be influenced by the positive subjective impression of Yunlin County residents. It is recommended to conduct sampling in other regions to obtain more comprehensive research results in the future.

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