

## A Brief Overview of E-Government Development in Macao: The Case of Macao One Account

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### *Abstract*

*To provide the society with more convenient public services, the Macao SAR Government embarked on the creation of a unified electronic service platform. This initiative commenced with the pilot project ePass and has since evolved into the mainstream platform known as Macao One Account, including its latest iteration, Macao One Account 2.0. Initially, the electronic public services offered were primarily inquiry-based. Over time, these services have expanded to include a variety of projects characterized by cross-regional integration and specific features, establishing them as significant milestones in Macao's e-government achievements. Furthermore, this study sheds light on the development process of the unified electronic service platform, highlighting the Macao SAR Government's challenges and success in optimizing e-government development planning, legal framework formulation, resource integration, and technical support. This discussion provides a comprehensive understanding of the overall e-government development in Macao and offers insights into the future trajectory of the Macao One Account.*

**Keywords:** E-government, Unified Electronic Service Platform, ePass, Macao One Account, Macao

### INTRODUCTION

Since its establishment in 1999, the Macao Special Administrative Region (SAR) Government has placed a high priority on the development of e-government. This commitment has been consistently highlighted in the annual policy addresses. The Macao SAR Government has successfully provided its residents with a myriad of convenient electronic public services. These services include social security benefit applications, service reservations, license registration and renewal, activity registration, and utility bill payment, among others. These concerted efforts have led to significant advancements in the development of e-government.

In 2019, the fifth Macao SAR Government took office and prioritized e-government as a pivotal entry point for public administrative reform. This initiative aims to transform the government into a more service-oriented entity, promoting the orderly development of e-government in both external services and internal management. A key milestone in these efforts lies in the Macao One Account, an integrated platform that delivers electronic public services across multiple sectors, such as social welfare, job hunting, transportation, healthcare, and education. This platform has garnered recognition and praise from the community in Macao. Throughout the development of the Macao One Account, the Macao SAR Government has not only provided essential cooperation in planning, legal matters, resource allocation, and technology but also incorporated lessons from the implementation of the unified electronic account pilot plan. This article chronicles the development and evolution of e-government in the Macao SAR Government since the handover, focusing particularly on the progress and impact of the Macao One Account.

### The Beginning of E-Government

From its early days, the Macao SAR Government has given priority to the development of e-government, recognizing the potential of modern information technology to enhance the quality and efficiency of public services. In its inaugural policy address following the handover in 1999, the government articulated a clear vision: to leverage technological developments to improve administrative efficiency, reduce bureaucracy, and enhance public convenience and engagement (Macao SAR, 2000).

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In pursuit of a cohesive strategy, the Macao SAR Government established the “E-Government Work Research Group” in 2001. This group was tasked with coordinating cross-departmental electronic projects and crafting a strategic blueprint based on its findings, leading to the creation of the “E-Government Strategy Research Report” (Macao SAR, 2005). This marked the official start of the SAR’s e-government initiatives. For the sake of further clarifying the direction and implementation of its strategy, the government introduced the “Macao E-Government Development Program (2005-2009).” This comprehensive plan covered several key areas: legal and policy modernization, administrative optimization and reorganization, enhancement of internal government operations through digital means, expansion of electronic public services, improvement of government information infrastructure, and bolstered promotion and communication efforts. The program aimed to harness information technology and administrative modernization to boost the efficiency and quality of public sector work, reduce operational costs, and continue delivering personalized and satisfactory services to citizens (Yin & Chen, 2016).

The development of ancillary facilities has also been a focus. Legally, the government enacted several laws to secure electronic operations: Law No. 5/2005 for Electronic Documents and Signatures, Law No. 8/2005 on Personal Data Protection, and Law No. 11/2009 to Combat Computer Crime. These laws not only give electronic documents and signatures legal validity but also enhance privacy protection and prevent computer-related crimes, ensuring a secure environment for electronic public services.

Resource integration efforts included the “E-Government Integrated Infrastructure” project, aimed at linking the network of all public sectors to streamline the management of information both internally and externally. This project also facilitated the creation of a government portal tailored to citizens, tourists, and investors, a comprehensive cross-departmental complaint handling system, and a document process tracking system (Li, 2004). Additionally, the government developed a “Form Download Platform” to provide easily accessible government forms (Macao SAR, 2005).

On the technical front, optical fiber technology has been used to ensure all-weather, high-speed, and secure network services for various inter-departmental electronic public services. The “E-Macao” project was initiated with the aim of delivering technical training to personnel and establishing software development standards (Zhang Ruixin et al., 2021). In addition, the Macao SAR Government introduced a mechanism for detecting security vulnerabilities, devised crisis response measures, and crafted an information security policy to bolster network security (Macao SAR, 2003).

The advancement of e-government stands as a pivotal means to enhance the caliber and effectiveness of public services, a priority consistently underscored by the Macao SAR Government. Since its inception, the Macao SAR government has meticulously crafted and refined an array of development strategies spanning legal frameworks, resource allocation, and technological infrastructure. These concerted efforts not only propel the evolution of e-government but also lay a robust foundation for the eventual establishment of a unified electronic service platform in the future.

### **The Unified Electronic Service Platform Pilot Plan**

To enhance service convenience, the Macao SAR Government has proposed a unified electronic service account. This initiative stems from the government’s commitment to advancing e-government. Historically, each public sector developed its own electronic services independently. These services are initially contingent upon a user identity verification system that uses account verification modes such as login names and passwords. However, this system did not allow for the sharing of credentials across different public sectors, compelling users to apply for separate accounts for each service (The Commission of Audit of the Macao Special Administrative Region, 2018). This not only inconvenienced users but also burdened the government with managing an increasing number of user accounts as electronic services expanded. Such complexities discouraged usage and escalated administrative costs.

In response to these challenges, the Macao SAR Government, guided by the “Macao E-Government Development Program (2005-2009),” planned to create cross-departmental electronic accounts. This would enable users to access electronic services from various public sectors securely and efficiently with a single

account. Consequently, the ePass unified electronic service platform pilot was launched in 2009. Initially, the platform offered only a limited set of online services, including voter registration information inquiries and updates, medical report applications, and provident fund inquiries (Yin & Chen, 2016). Notwithstanding this limitation, ePass significantly streamlined the use of some public services and reduced the workload of frontline service staff, laying a solid foundation for the expansion of comprehensive electronic public services.

The ePass, serving as the Macao SAR Government's electronic service platform, adopted a "launch first, adjust later" development strategy. This approach, however, faced challenges due to the absence of supporting laws, which complicated its widespread adoption. Initially, the government planned to implement relevant supporting legislation before the launch of ePass to ensure that the actions of service recipients were legally valid and met future development needs. Nonetheless, this plan was met with reservations and concerns from various public sectors regarding the draft content of the supporting laws.

The concerns raised included several key issues: (1) the security risks associated with sole reliance on a username and password for legal identity verification; (2) the requirement for public sectors providing electronic services to create administrative regulations for each service type, leading to a notable escalation in administrative expenses; (3) the legal validity of minors using electronic accounts to access services; (4) the predicament with ePass mandating a fixed ID number for user identification, disregarding potential alterations in ID numbers resulting, for instance, from license renewal for non-Macao residents; and (5) the challenges in verifying whether NGOs and companies had the necessary permissions to use the services, necessitating supplementary processing (The Commission of Audit of the Macao Special Administrative Region, 2018). Given the complexities of issues and considering that the electronic services available at that time were mainly for inquiries and not for applications, and there was no immediate need to address the identification concerns of minors, non-Macao residents, or NGOs and companies, the government opted to continue with its strategy of "launch first, adjust later." As a result, the supporting laws were not introduced concurrently with the launch of ePass.

The unresolved issues mentioned previously have impeded the expansion of ePass services. Since ePass did not fully address these problems at its launch, it encountered various practical challenges. First, due to legal constraints, ePass was limited to providing only inquiry-type services. As a result, some electronic public services continued to require separate accounts for access through individual public sector platforms, making it difficult for ePass to replace these accounts comprehensively and failing to eliminate the inconvenience of managing multiple accounts for users. Second, on some public sector websites, services equivalent to those provided by ePass were accessible without any account, diminishing the public's incentive to use ePass (The Commission of Audit of the Macao Special Administrative Region, 2018). Third, ePass was only applicable to Macao residents aged 18 and above, thus excluding underage residents, non-Macao residents, as well as NGOs and companies, which left a significant gap in meeting the broader social demand for services.

ePass was initially designed to solve the problem of individuals needing to manage multiple accounts. To allow ePass to provide a broader range of services in the future, the Macao SAR Government planned to implement relevant supporting laws. However, due to the various unresolved problems at the time, which could not be effectively addressed in the short term, ePass lacked sufficient legal support at its launch. This shortfall made it difficult for the platform to expand its services in the future. Additionally, the platform failed to meet social demands, and its actual usage fell short of the expected outcomes. This led to significant criticism from both the Commission of Audit of the Macao SAR and the general public.

### **Optimization of e-government development plan and the launch of Macao One Account**

The Macao SAR Government has reflected on its past shortcomings in the e-government and has taken proactive steps to address these issues. Not only has a new development plan been formulated, but also significant improvements have been made in law, resources, and technology. In an effort to improve the overall planning and implementation of e-government, the government reviewed the "E-Government Strategy Research Report" and the "Macao E-Government Development Program (2005-2009)." Drawing on international experiences and feedback from various public sectors, the "Macao SAR E-Government Overall Plan 2015-2019" was developed. This plan specifies the tasks, clarifies the planning, and sets a clear timetable.

The government hopes that through the construction of a universal electronic management platform, and by setting standards and improving network infrastructure, it will gradually promote the optimization of service processes and the electronic management of public services (The Commission of Audit of the Macao Special Administrative Region, 2018).

In pursuit of improved governance, the Macao SAR Government implemented adjustments in law, resource integration, and technical support to better align with the evolving needs of e-government. Legally, the government formulated Administrative Regulation No. 35/2018 “Electronic Services” to solve the problem of the interconnection of online platforms across various public sectors, enabling residents to access electronic public services through a unified. Moreover, to lend greater legal validity to electronic services and avoid the need to amend multiple existing laws, Law No. 2/2020 “E-Government” and Administrative Regulation No. 24/2020 “E-Government Implementation Rule” were established, providing a solid legal basis for digitization of public services (Yu & Hoi, 2022). The enactment of these laws marks a significant advancement in the e-government initiative.

In terms of resource integration, the Macao SAR Government launched a new version of the government portal, enhancing its functionality, style, and layout to improve user accessibility (Macao SAR, 2018). Additionally, to enable easy public access to government data, an open data platform was created. As of March 2024, this platform hosts a cumulative total of 662 datasets across various sectors such as tourism, gaming, public transportation, healthcare, environmental management, administrative and legal affairs, among others, facilitating the reuse and application of government data (The Macao SAR Government, 2024).

On the technical front, to support the unified management and secure storage of government data, the inaugural government data center commenced operations in 2010, with subsequent expansion completed in 2017 (Macao SAR, 2011, 2017). It has been pivotal in providing cloud services and supporting high scalability, stability, and security across public sectors. In a significant move to bolster these efforts, the Macao SAR Government signed a cooperation agreement with Alibaba Group in 2017. This agreement encompasses the construction of a cloud data center, the establishment of a unified government service network, and talent development (Zhang Ruixin et al., 2021). These initiatives are part of a broader strategy to integrate data across the Macao SAR, improve economic and social operations, and promote the development of smart cities.

With the improvement of relevant ancillary facilities, Macao has also launched a new unified electronic service platform. Following the stipulations of Administrative Regulation No. 35/2018 “Electronic Services,” which mandates the establishment of a unified electronic platform, the Macao SAR Government aimed to integrate accounts from various public sectors into a single platform, thereby realizing the “one network and one account” strategy. As a result, Macao One Account was launched on January 1, 2019, coinciding with the implementation of Administrative Regulation No. 35/2018. Concurrently, ePass ceased accepting new applications and began transitioning users to the Macao One Account.

In the initial phase, the Macao One Account provided electronic public services from six sectors, including appointment services, civil servant job applications, social security fund contribution inquiries, and tracking the application process for catering establishment licenses. Additionally, with the use of electronic signatures, applications and renewal for employment quotas for foreign domestic helpers, as well as stay permits, could be processed online (The Macao SAR Government, 2024). The Macao One Account introduced more stringent security measures to overcome the problems of ePass’s identity verification mechanism and its restricted user base. Users are required to provide login passwords, one-time passwords, security verification codes, facial recognition, or a combination of biometric data, depending on the security needs of different services (Jornal VA KIO, 2022). Furthermore, NGOs and companies are now able to open accounts, enhancing accessibility for both individual citizens and businesses.

Since the launch of Macao One Account, the Macao SAR Government has continued to improve the laws, integrate resources, and improve technical support. As a result, the number of users has significantly increased, from 67,000 before the implementation of Law No. 2/2020 “E-Government” in September 2020 to over 330,000 by April 2022. This accounts for approximately 48% of Macao’s total population at that time. Moreover, the number of electronic public services available has expanded to 127 (The Macao SAR

Government, 2024). These developments have led to society's widespread recognition and affirmation of the Macao One Account.

Despite the ePass pilot program failing to meet expectations and drawing criticism from society, it nonetheless spurred the reformation of e-government practices. The Macao SAR Government not only conducted a thorough review of past deficiencies but also devised a new development strategy, optimizing legal frameworks, resource allocation, and technological infrastructure accordingly. These efforts laid the groundwork for the launch and subsequent advancement of the Macao One Account, contributing significantly to its success.

### **Optimization of Macao One Account**

Since its introduction, the Macao One Account has been continually optimized by the Macao SAR Government to meet the growing demand for convenient electronic public services. Initially, the design of Macao One Account was predominantly government-oriented, which resulted in a service that lacked relevance and personalization for individual users. Recognizing these shortcomings, the government decided to shift its development strategy towards greater personalization. The repositioning involved changing the platform's original focus from "One Account for Macao Public Services" to "One Account for My Public and Personal Services" (Macao SAR, 2022).

On April 11, 2022, this strategic pivot culminated in the launch of a significantly upgraded version, Macao One Account 2.0. Designed with the purpose of "user-oriented, optimized experience, and convenient service," Macao One Account 2.0 has been innovated through system reconstruction, which includes clear layouts, advanced technology, improved data management, and strengthened cloud operation (The Macao SAR Government, 2024). With its greater emphasis on personalization and convenience, Macao One Account 2.0 has implemented reforms across various dimensions, including the scope of applications, target service groups, and service processes. These changes are aimed at creating a more tailored and user-friendly experience for all residents of Macao.

Macao One Account 2.0 has significantly broadened its service offerings, extending from strictly public sector applications to encompass judicial and private enterprise fields, as well as providing vital cross-border services. This expansion has positioned it as a crucial platform for information dissemination. Users can now handle a variety of tasks through the platform, including submitting court documents, paying litigation fees, taxes, and water bills, and scheduling appointments for public services in the Guangdong-Macao In-Depth Cooperation Zone in Hengqin (Government Information Bureau, 2024). Additionally, the "My Information" features of Macao One Account 2.0 enhances the platform's utility by aggregating data from various public sectors. This allows for the timely release of official information, including civil defense alerts, major news updates, clarifications, and evacuation guidelines. It also provides practical information for daily life, such as port entry and exit statuses, weather updates, and school closures during natural disasters. To further strengthen the communication between the Macao SAR Government and its residents, Macao One Account 2.0 has integrated functions for policy consultation, feedback on public opinion, tracking case progress, and inquiring about service procedures (The Macao SAR Government, 2024). This integration has transformed Macao One Account 2.0 into a centralized hub for official communications and interactions between the government and its citizens.

In light of service scope, Macao One Account 2.0 has been meticulously developed to provide personalized services that cater to different groups. Recognizing the importance of equal access to public services, the Macao SAR Government has integrated features specifically designed for the elderly and special needs groups. These include alternative login options, such as facial recognition or touch, alongside the traditional password method to accommodate the older population. In addition, through cooperation with NGOs, blind users can utilize screen-reading software to access services, while enhancements like text enlargement and high-contrast mode support color-impaired individuals (Government Information Bureau, 2024). Furthermore, Macao One Account 2.0 addresses the professional needs of various groups by incorporating electronic professional cards for government or designated institution-issued identities, such as those for medical personnel, teachers, and

lawyers. These digital cards carry the same legal validity as their physical counterparts (The Macao SAR Government, 2024), thus serving different professional needs effectively.

In terms of service processes, Macao One Account 2.0 has significantly improved cross-sectoral collaboration, creating an “All in One Go” service model. This initiative aims to reduce the frequency of in-person visits, simplify administrative procedures, and deliver integrated services efficiently. A notable feature is the new identity confirmation method that eliminates the need for a physical ID card, facilitating transactions within public and licensed private entities. This method is currently used for several services, including port entries and exits, medical voucher claims, and professional development programs (Macao SAR, 2024). In addition, the platform has simplified the process of updating correspondence addresses, allowing users to make changes across different sectors through a single online interface, thereby saving time and enhancing convenience (The Macao SAR Government, 2024). Looking ahead to 2024, the government plans to launch integrated services for significant life events, such as births and marriages, under the “All in One Go” initiative (Macao SAR, 2023, 2024).

Following the Macao SAR Government’s determination to prioritize personalization within the Macao One Account framework, significant enhancements have been made in Macao One Account 2.0, particularly in its applications and services. This iteration not only broadens service accessibility to encompass the private sector and extend beyond the confines of the Macao region but also tailors services to cater to diverse user demographics. Furthermore, it advocates for integrated services to streamline user experiences, thereby reducing time expenditures. These advancements position Macao One Account 2.0 as evolving toward the platform embracing “One Account for My Public and Personal Services,” aligning closely with the people-oriented governance approach upheld by the Macao SAR Government.

## **CONCLUSION**

As an important achievement of the Macao SAR Government’s e-government initiatives, Macao One Account has exceeded 574,000 users as of March 28, 2024, and now offers more than 360 convenient and diverse electronic services (The Macao SAR Government, 2024). Reflecting on the development of Macao One Account, it is clear that from its inception, the Macao SAR Government has prioritized the enhancement of public service quality and efficiency through strategic planning, legal framework, resource allocation, and technological innovation.

The inception of the unified electronic service platform was aimed at consolidating electronic accounts across various public sectors to simplify processes for both users and the government. This led to the initiation of the ePass pilot project. However, ePass encountered significant hurdles, including issues with legal validity and security, that could not be quickly resolved. Consequently, the government adopted the “Launch First and Adjust Later” strategy. This approach, while expedient, led to challenges in service expansion and popularization, ultimately preventing ePass from meeting its intended goals and social demands.

Recognizing these shortcomings, the Macao SAR Government took steps to refine its approach to e-government following the ePass experience. With the introduction of the Macao One Account, new legislation such as Administrative Regulation No. 35/2018 “Electronic Services” and Law No. 2/2020 “E-Government” was enacted. These measures, along with ongoing enhancements to the supporting infrastructure, provided a more robust foundation for the development of Macao One Account. In response to evolving needs, the government shifted its focus towards a more personalized service delivery model. This strategic pivot not only expanded the range of electronic services beyond the public sector but also tailored these services to meet the diverse needs of different groups. Such personalization has been instrumental in optimizing service processes and integrating functions, leading to a substantial increase in both user numbers and service offerings. Today, Macao One Account stands as Macao’s premier unified electronic service platform, exemplifying effective e-government practices and significantly enhancing user experience across the region.

This overview of the development of the Macao One Account highlights the Macao SAR Government’s enduring commitment to e-government, showcasing multiple strategic initiatives aimed at improving the sector through improvements in legal frameworks, resource management, and technology. Initially, the ambition to

fully implement electronic public services and reduce administrative costs grappled with challenges due to early oversights. However, the government later reviewed the past shortcomings and systematically coordinated the cooperation of various development factors to accelerate the progress of e-government. As the focus shifts towards a more personalized development approach, the future of Macao One Account looks promising. It aims to align with the Macao SAR Government's broader societal and economic development plans by introducing more cross-border and integrated services. Moreover, leveraging global technological advancements, the government plans to incorporate service tools into Macao One Account.

In optimizing the development of this platform, the Macao SAR Government faces the complex task of ensuring seamless interconnectivity between the Macao One Account, the Business & Associations Platform (dedicated to Macao's business enterprises and associations), and the Government Account (which focuses on unifying the internal government management). This effort involves addressing challenges such as legal protections for cross-border personal data transfers and connecting with data platforms across different regions. In addition, there is a pressing need to find a balance between the utilization and regulation of artificial intelligence technology to further enhance service delivery. By addressing these issues, the ongoing improvements to Macao One Account are pivotal in supporting the transformation of the Macao SAR Government into a more service-oriented entity, thereby marking a significant step in the evolution of its e-government services.

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