Development of a Centralized Digital Platform to Improve Visibility of Local Service Providers in Puerto Rico

Ronald J. Vélez Rodríguez
Master in Engineering Management
Héctor J. Cruzado, PhD
Graduate School
Polytechnic University of Puerto Rico

Abstract *— Independent local service providers in Puerto Rico rely heavily on informal digital channels, such as social media groups and personal referrals, to promote their services. These channels lack structure, consistency, and effective search capabilities, creating challenges for provider visibility and customer access to reliable service information. This project developed a managerial planning and feasibility framework for a centralized digital platform intended to improve visibility for independent service providers and enhance customer access to organized service information. The project applied a structured DMAIC-based methodology focused on analysis and planning rather than system implementation. Secondary data sources and documented observations were used to establish baseline service discovery conditions and identify gaps related to information organization, search efficiency, and user confidence. The results demonstrated that fragmented and informal discovery practices limited effective service matching and provider exposure. The conclusions supported the feasibility of a centralized managerial framework as a foundation for future platform development and implementation efforts within the Puerto Rican service market.*

Key Terms *— Centralized digital platform, managerial planning framework, service discovery, service provider visibility.*

INTRODUCTION

Digital media has become the primary channel through which individuals access information and services in Puerto Rico, shaping how customers locate providers for everyday needs such as home maintenance, cleaning, caregiving, and repair services. Despite this shift, many independent local service providers operate with limited or inconsistent online visibility due to reliance on informal and fragmented digital channels. These conditions hinder efficient searching, comparison, and evaluation of service options, increasing customer effort and reducing confidence during the selection process. The absence of a centralized and structured service discovery mechanism further limits the ability of both providers and customers to interact efficiently within local markets.

The objective of this project was to develop a managerial planning and feasibility framework for a centralized digital platform that improved visibility for independent local service providers and enhanced customer access to reliable and organized service information within the Puerto Rican context. Without a structured and centralized approach, both service providers and customers remain constrained by inefficient discovery practices that limit visibility, trust, and informed decision making in local service markets.

LITERATURE REVIEW

Digital Platforms and Service Marketplaces

Digital platforms that centralize information and structure user interactions have demonstrated significant value across multiple sectors. Research examining a virtual platform developed for community organizations in eastern Puerto Rico showed that centralized digital environments improve communication, coordination, and access to shared resources among diverse stakeholders [1]. The study illustrated how a unified digital system reduced fragmentation and enabled more efficient information exchange, supporting improved visibility and participation.

Similar benefits were observed in the Panoramica platform, which organized data related to startups, investors, and support organizations across Puerto Rico [2]. By consolidating dispersed information into a structured and navigable environment, the platform enhanced discoverability and facilitated informed decision making. This example demonstrated how centralized digital marketplaces supported transparency and reduced the complexity associated with locating relevant service information.

The literature also identified limitations associated with informal and fragmented digital promotion channels. Studies on regional digital information systems across the Caribbean highlighted persistent challenges related to inconsistent data structures, limited standardization, and weak coordination frameworks [3]. These deficiencies reduced the reliability and accessibility of information, reinforcing the need for centralized platforms that followed common organizational standards.

Trust and transparency emerged as essential factors influencing platform effectiveness. Centralized systems that offered structured information and consistent presentation supported greater user confidence and reduced uncertainty during service selection. Prior research emphasized that platform design played a critical role in enabling trust by improving information clarity and reducing ambiguity within digital service environments [1, 2].

Digital Inclusion and Access in Puerto Rico

Digital inclusion research within Puerto Rico revealed ongoing disparities in access, adoption, and effective use of digital tools. A study focused on community centers in Carolina documented challenges related to connectivity, device availability, and digital literacy that limited users' ability to interact confidently with online information systems [4]. These barriers affected both information access and the quality of user engagement with digital platforms.

Further analysis of broadband expansion efforts in Loiza demonstrated that increased internet availability alone did not result in meaningful digital participation [5]. Although connectivity improved, users continued to experience difficulty navigating fragmented information sources and identifying reliable content. These findings emphasized the importance of pairing access with structured and user-friendly digital environments.

Research examining digital adoption within the Puerto Rican business sector identified substantial gaps among small and medium sized enterprises [6]. Many businesses lacked a consistent digital presence, which limited their visibility and made it difficult for customers to locate accurate service information. This condition contributed to uneven market participation and reinforced reliance on informal promotion methods.

Broader studies on digital inequality in Puerto Rico highlighted how socioeconomic and educational factors influenced information seeking behaviors and digital confidence [7]. Limited digital proficiency and inconsistent information structures created barriers that shaped how individuals searched for and evaluated online content. These findings reinforced the need for centralized platforms designed to support clarity, accessibility, and inclusive participation.

Existing Service Discovery Models and Platforms

Existing service discovery models provided insight into features associated with effective digital marketplaces. Platforms that emphasized organized information structures, intuitive navigation, and standardized content demonstrated improved usability and user engagement [2]. These characteristics supported efficient service discovery and reduced the effort required to locate relevant providers.

Despite these strengths, gaps remained in platforms serving the Puerto Rican context. Many available systems were not tailored to local service markets or independent providers operating within

informal economies. The absence of region specific platforms limited the effectiveness of existing tools and contributed to continued fragmentation in service discovery processes [6].

Lessons drawn from regional and global platforms emphasized the importance of adaptability and contextual design. Research consistently showed that digital systems aligned with local conditions and user capabilities were better positioned to support equitable access and sustained engagement [3, 4]. These findings informed the conceptual foundation of the centralized digital platform evaluated in this project.

METHODOLOGY

This project applied a structured managerial methodology to evaluate the feasibility and design requirements of a centralized digital platform intended to improve visibility and access for independent local service providers in Puerto Rico. The methodological approach focused on analysis and planning rather than system implementation, emphasizing the assessment of existing conditions, identification of stakeholder needs, and evaluation of potential platform features. A DMAIC-based framework guided the overall structure of the methodology to ensure a systematic evaluation of existing conditions and potential improvements.

Assessment of the Current Service Discovery Environment

The assessment of the current service discovery environment examined how independent local service providers promoted their services and how customers searched for available service options within Puerto Rico, establishing a baseline understanding of the operational challenges affecting both groups in the existing digital environment.

Data Collection and Measurement Approach

Data collection for this project relied on secondary sources and structured analytical review rather than direct surveys or interviews. Publicly available studies, digital market reports, and prior research related to digital connectivity and service discovery behaviors in Puerto Rico were examined to characterize baseline conditions. Due to limited availability of Puerto Rico specific datasets focused explicitly on local service discovery platforms, widely cited digital usage indicators were used as proxy measures.

Baseline metrics were defined to characterize existing service discovery conditions rather than platform performance. These metrics focused on provider visibility, information organization and completeness, search efficiency, and user confidence during service selection. Each metric was assessed using documented observations of informal digital practices and publicly available indicators, establishing reference conditions against which the proposed platform concept was evaluated. The data and baseline metrics defined during the Measure phase were structured to support subsequent analysis in the Analyze phase by enabling the identification of patterns, gaps, and root causes affecting service visibility and access.

Platform Design and Evaluation Approach

The platform design and evaluation approach was developed directly from the gaps and inefficiencies identified during the assessment and measurement phases of the project. The Improve phase of the DMAIC framework guided the translation of observed deficiencies into structured design outputs intended to address fragmentation, limited visibility, and inefficient service discovery practices.

Improve phase outputs focused on defining a conceptual platform model rather than developing a functional system. These outputs included standardized service listing structures, categorized provider profiles, and centralized information organization. Each design element was explicitly linked to baseline challenges documented during earlier phases. Fragmented provider visibility informed the need for a unified listing framework, while inconsistent service information supported the definition of standardized provider attributes.

Inefficient search processes informed the inclusion of category-based navigation and filtering concepts.

Evaluation criteria were defined to assess the proposed platform concept from a managerial and user centered perspective. These criteria were intentionally limited to dimensions that could be evaluated analytically without system implementation. The primary evaluation criteria included usability, accessibility, information clarity, and service discovery effectiveness. Usability focused on the logical organization of platform components and the ease with which users could navigate service categories. Accessibility emphasized the platform's ability to support users with varying levels of digital proficiency through simplified structures and intuitive interaction flows.

Information clarity evaluated whether the proposed platform design supported consistent and comparable presentation of service provider data. This criterion directly addressed the lack of standardized information observed in informal digital channels. Service discovery effectiveness evaluated the extent to which the proposed features reduced search effort and improved provider visibility relative to baseline conditions.

The evaluation approach examined alignment between Improve phase outputs and the defined baseline metrics. Platform features were assessed based on their ability to improve provider visibility, enhance information organization, reduce search inefficiencies, and support user confidence during service selection. Evaluation judgments were derived from logical consistency between observed conditions, defined design outputs, and established trends in digital service marketplaces, providing a structured basis for assessing the feasibility and relevance of the proposed platform concept.

RESULTS

The primary result of this project was the development of a managerial planning and feasibility framework structured around the DMAIC methodology. The framework translated each DMAIC phase into specific managerial planning components that addressed documented deficiencies in the existing service discovery environment. The Define phase established the problem context, stakeholder groups, and service visibility challenges affecting independent local service providers. The Measure phase documented baseline service discovery conditions using proxy indicators related to digital usage, information organization, search efficiency, and user confidence. The Analyze phase supported the identification of gaps and root causes associated with fragmented information structures and informal discovery practices. The Improve phase produced conceptual planning outputs, including standardized service listings and categorized provider profiles, while the Control phase emphasized documentation consistency and alignment between framework components and the stated project objective.

Figure 1 presents a conceptual representation of the proposed managerial planning and feasibility framework and illustrates its alignment with the DMAIC methodology and associated planning outputs. The figure emphasizes how analytical inputs are translated into structured planning outputs within a centralized framework.

To further contextualize the value of the proposed framework, a comparative analysis was conducted between the existing service discovery environment and the proposed centralized framework. Figure 2 compares the current state, characterized by fragmented information sources and informal promotion channels, with the proposed state under the centralized framework, which emphasized structured information, improved provider visibility, and more efficient service discovery processes.

To demonstrate how the proposed framework addressed documented conditions, the baseline service discovery environment was revisited and analyzed in relation to the identified planning outputs.

Analysis of the current service discovery environment indicated that independent local service providers predominantly relied on informal

digital channels, including social media groups and personal referral networks. These channels exhibited fragmented information structures, inconsistent provider visibility, and limited search functionality. As a result, service providers experienced uneven exposure across service categories, while customers encountered difficulty locating, comparing, and verifying available service options.

Baseline metrics related to provider visibility, information organization, search efficiency, and user confidence revealed identifiable gaps in the existing digital environment. Service information was often incomplete, unstandardized, and dispersed across multiple platforms, requiring customers to manually navigate posts and comments. This increased search effort and reduced confidence during the provider selection process.

The Improve phase produced defined conceptual outputs intended to address these observed deficiencies. These outputs included standardized service listing structures, categorized provider profiles, and centralized information organization principles. Mapping these outputs to the baseline metrics demonstrated logical alignment between identified gaps and the proposed planning framework. From a feasibility perspective, the results supported the viability of a managerial framework focused on centralized service discovery, providing a structured and defensible foundation for future platform development efforts.

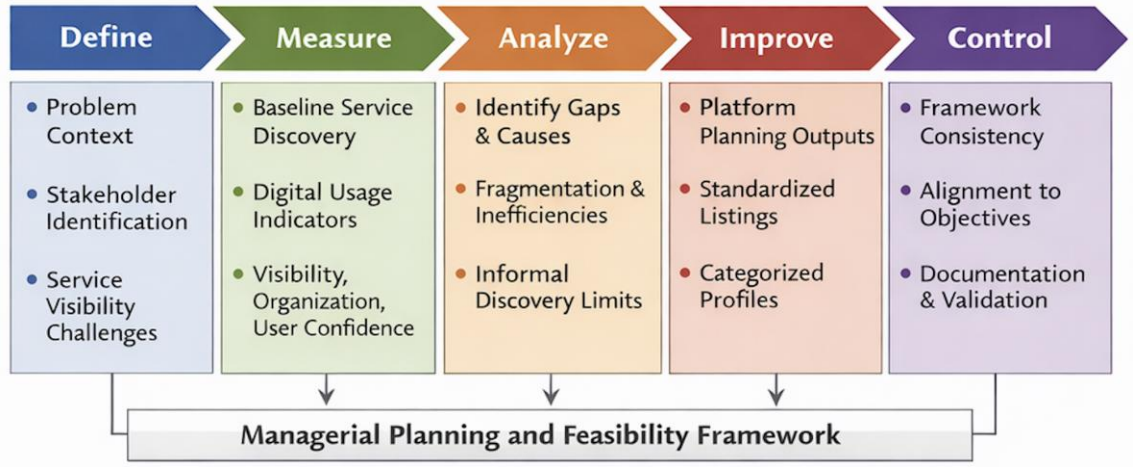

Figure 1

Managerial Planning and Feasibility Framework Aligned with DMAIC Methodology

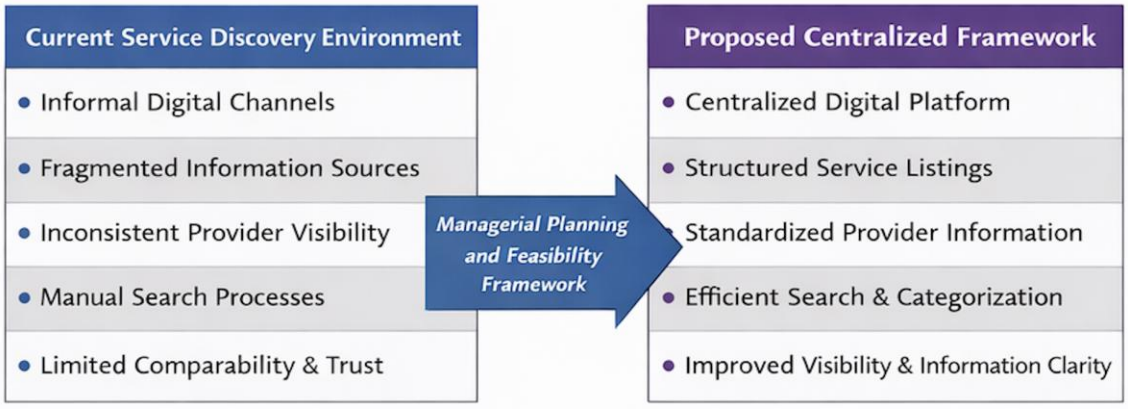

Figure 2

Comparison of Current Service Discovery Environment and Proposed Centralized Framework

CONCLUSIONS

This project developed a managerial planning and feasibility framework to address challenges associated with service visibility for independent local service providers in Puerto Rico. The findings demonstrated that existing service discovery practices relied heavily on informal digital channels that lacked structure, consistency, and effective search capabilities. These conditions limited provider visibility and increased the effort required for customers to locate reliable service information.

By applying the DMAIC framework, the project established a structured approach for analyzing baseline service discovery conditions and identifying gaps related to information organization, search efficiency, and user confidence. The resulting framework translated these gaps into conceptual platform outputs aligned with observed needs and established trends in digital service marketplaces.

The conclusions supported the feasibility of a centralized digital framework as a managerial planning tool rather than a technical implementation. The framework provided a defensible foundation for organizing service information, improving discoverability, and supporting informed decision making within local service markets. These conclusions suggested that future efforts could build upon the framework to guide detailed design, implementation, and evaluation activities beyond the scope of this project.

REFERENCES

[1] Foundation for Puerto Rico. Launch of a virtual platform for the Community Innovation Hub. 2023.

[2] Invest Puerto Rico. Presentation of Panoramica as an information platform for the local entrepreneurial ecosystem. 2023.

[3] Hambleton, I R., Popovic, B., and Hutton, D. Open data practices in small Caribbean islands. Open Data Studies. 2024.

[4] Rosario Albert, L., and Bayuelo Florez, E. Digital equity in Puerto Rico access adoption and digital skills in community centers. Journal of Community Informatics. 2025.

[5] Rosario Albert, L. Digital inclusion outcomes in Loiza Puerto Rico. Journal of Community Informatics. 2025.

[6] Llorens Gomez, A L. Digital gap indicators in the Puerto Rico business sector. Revista Global de Negocios. 2018.

[7] Finney Rutten, L J., Agunwamba, A A., Wilson, P M., Jacobson, D J., Fan, C., Breitkopf, C R., and Vander Boom, C E. Geographic and socioeconomic patterns of health information technology use in Puerto Rico. Journal of Medical Internet Research. 2012.