

QR CODE BASED PWD ID FOR Combating the Proliferation of Counterfeit

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ABSTRACT

The City Government of Bacolod aims to digitize every government transaction including the issuance of Persons with Disability (PWD) IDs. There are confirmed reports from the city government itself that there is a rampant issuance of fake PWD IDs. This study proposes the inclusion of quick response (QR) codes in the system to further strengthen the security of obtaining and using PWD IDs in the city and to automate the PWD ID application.

This study taps the personnel of the Department of Social Services Division (DSSD) who are using the system in generating and printing PWD IDs. The study will then ask the users to rate the system based on its functionality, reliability, usability, efficiency, maintenance and security.

Putting QR codes in PWD IDs promotes and establishes trust between the city government and the stakeholders. The researchers conducted a series of interviews with the staff of Persons with Disability Affairs Office to further understand the process of acquiring PWD IDs. These include the documents needed such as medical abstract and certification from the village.

The implementation showed significant improvement in using the system including faster encoding and issuing PWD IDs with QR codes. Staff handling the software expressed satisfaction in using the new system.

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I. INTRODUCTION

Bacolod City aims to be a "Super City" and one of its aspirations is to digitize government services.

Based on the 2022 Census of Population and Housing conducted by the Philippine Statistics Authority, Bacolod has a population of 600,783. Of which, around 12,000 are registered as persons with disability (PWD) based on the latest figure from the Persons with Disability Affairs Office (PDAO) under Department of Social Services and Development (DSSD). February 2024, City Mayor Alfredo Benitez recalled all existing PWDs IDs issued by the city government due to alleged usage of fake PWDs as part of the city's ongoing program to secure and streamline the processing of the PWD IDs. [1] According to Benitez, this is an essential move to ensure data security, complying with updated regulations and addressing other relevant concerns regarding PWD IDs. In February 2024, the DSSD announced that it had discovered over 100 fake PWD IDs in the city. According to DSSD head Alma Gustilo, these fake documents are either produced here using a different kind of paper or the disabilities written are wrong. [2] The mayor instructed the DSSD and PDAO to adhere to the guidelines outlined in Republic Act 10754, which expands the benefits and privileges for Persons with Disabilities (PWDs), as well as its Implementing Rules and Regulations (IRR). Additionally, the directive emphasized compliance with Department of Health (DOH) Administrative Order No. 2013-0005-A and other relevant regulations when issuing and replacing new PWD IDs [3].

Traditionally, a PWD will submit all the requirements at the office of PDAO. They will be given a form to fill out and the office will then print and issue an ID without security features. The paper-based PWD IDs are susceptible to counterfeiting and tampering. There is an existing Excel file containing all the data of the PWDs. Moreover, the manual process is time-consuming and prone to duplication of ID.

Senator Sonny Angara called for an investigation on the distribution and use of fake PWD ID in 2020. He said that there are reports of individuals using fake ones as discount IDs during the COVID-19 pandemic. He also suggested that there should be a review of the implementation of Republic Act 10754 or An Act Expanding the Benefits and Privileges of Persons with Disability to ensure only those who are in actual need of the benefits are granted while also protecting the establishments against abuses. [4]

In July 2023, the Quezon City government in collaboration with the Persons with Disability Affairs Office implemented a new registration system in obtaining PWD IDs.

The city will utilize the online portal QC E-Services where applicants are required to submit essential documents as proof of their disability.

Before the COVID-19 pandemic, there are about 78,000 PWD ID holders in the city. After implementing the new system, the number decreased to over 52,000. According to Mayor Joy Belmonte, there are about 7,000 applications that were rejected that contains counterfeit medical certificates from individuals who did not qualify as a PWD. [5]

In May 2024, local legislators of Cebu City pushed for an investigation into the alleged falsification of PWD IDs. According to Councilor James Anthony Cuenco, these cards were sold for about P2,000 to P4,000 to able-bodied individuals. Cuenco added that there are also certain individuals who are allegedly connected with the mayor's office who were involved in the scheme.

Cuenco suggested to eliminate typewritten cards to ensure regular renewal and employing advance technology for authentication. [6]

In response to the growing concern over counterfeit IDs there is a need to enhance security and authenticity of PWD IDs. With the use of Quick Response (QR) code, duplication of IDs a QR code-based system was developed to digitalized creation of PWD IDs. PWD's information will also be stored in a centralized database managed by Management Information Technology and Computer Services (MITCS).

With the use of this QR-based system, it seeks to address these challenges and offer a secure, reliable and efficient way to identify PWDs. The system involves a generation of unique QR that when scanned, will show the validity and relevant information of the PWD card holder.

QR code stands for quick response code. QR code is a type of barcode that can be read easily by a digital device that is stored in a series of pixels in a square-shaped grid. [7]

According to the Department of Interior and Local Government (DILG), through the Ease of Doing Business program with the Department of Information and Communications Technology, the government will advance efforts to gradually shift to 100 percent digitalization of LGU frontline services by infusing technological platforms in processing documents from the government. [8]

II. METHOD (Methodology)

There are several key steps in implementing the QR-based PWD ID system to combat the proliferation of counterfeit IDs. The researcher used Agile Software Development Methodology which focuses on efficient profiling of PWDs and provides a secure verification of QR-based PWD ID, ensuring rapid iterations, stakeholder feedback and continuous improvement throughout the development process. Agile Software Development Methodology as explained [9] ensures that the QR-based PWD ID system is flexible, adaptable, allowing teams to deliver high quality products in a collaborative and iterative manner.

A. Requirements Gathering

The researcher conducted an interview with PDAO staff to gather information to better understand the current process of acquiring PWDs Id for the researcher to provide an effective and automated generation of QR-based PWD ID. During this stage, requalification requirements were also discussed, this includes the submission of support documents to prove the eligibility of the PWD. These documents include Certificate of Residency from the PWD's respective barangays, Medical Certificate for City Health Office (CHO) for new applicants and old PWD ID for renewal or existing PWD members.

B. Planning

During the planning, software and hardware requirements were identified and business processes were also defined. These business process is as follows:

If individuals are verified to be eligible PWD members PDAO staff will proceed to encoding of PWD's relevant information and uploading of ID picture and signature or thumbnail of the PWD.

Then, generation of a unique PWD ID number which will serve as the permanent number incase of card replacement or renewal. This also includes the types of abilities, date issued and expiry date of 5 years after the

date issued based on National Council on Disability Affairs Administrative Order No. 001 Series of 2021. After which, printing of PWD IDs with QR on PVC.

For validation of the PWD IDs, business establishments such as pharmacies and grocery stores can scan the QR on the PWD ID using any generic QR reader on both android and IOS phones for more accessibility verification of the authenticity of the IDs.

C. Development

The researchers made sure to create functionalities and features that align closely to the stakeholders' needs and preferences, implementing a user-centric design approach aimed at delivering an intuitive user experience. The researchers suggest the following specifications for the system, aiming to enhance the performance, usability and security:

Software requirements :

Operating system : Windows 10;
Browser : Google Chrome / Microsoft Edge;
PHP, Web Hosting / Server, MySQL, JQuery, Javascript, CSS, Bootstrap
QR Scanner App for android or Camera for IOS Device.

Hardware requirements :

Personal Computer / laptop, specification :
Operating System : Windows,
Processor : 12th Gen Intel(R) Core(TM) i5-12400 2.50 GHz,
RAM : 8GB,
Hard Disk : 500GB
System Type : 64-bit operating system, x64-based processor;
QWERTY Keyboard; USB Optical Mouse; PVC printer; HD 1080p web camera; Signature pad; Mobile Phone (Android / IOS).

D. Testing

A thorough testing and runthrough of each of the steps were performed to ensure the effectiveness of the process. Training for the frontliners was also conducted to equip them with knowledge and technical skills necessary to effectively handle customer inquiries, troubleshoot issues and provide quality service.

E. Deployment

Once the testing is complete, the software is deployed to the production environment. Part of the deployment is information dissemination to the people involved in the implementation of the new process of acquiring and verifying the new QR-based PWD IDs.

Information Dissemination:

It is crucial that all key stakeholders will be informed of the changes in the system of obtaining PWD IDs. Personnel of concerned government agencies will be trained how to use the new system. The city government will conduct a forum with the business sector on how the new system works as well as how to check if a PWD ID is valid or not.

F. Maintenance

System is maintained and improved to ensure that it continues to meet the stakeholder's needs and expectations. Further improvement is also essential to enhance the efficiency, functionality, and user experience of the software, ensuring it remains effective and meets the evolving needs of the stakeholders.

III. RESULTS

The results of our implementation of the QR-based PWD ID system demonstrated significant improvements in encoding, efficiency, usability, and security of generating and verifying of QR-based PWD IDs. The result of this study includes the screenshots of dashboard pages with PWD data analysis, generation of PWD ID with QR page, Qr verification and user satisfaction survey response of DSSD staff.

Figure 1.0 PWD Data Analysis

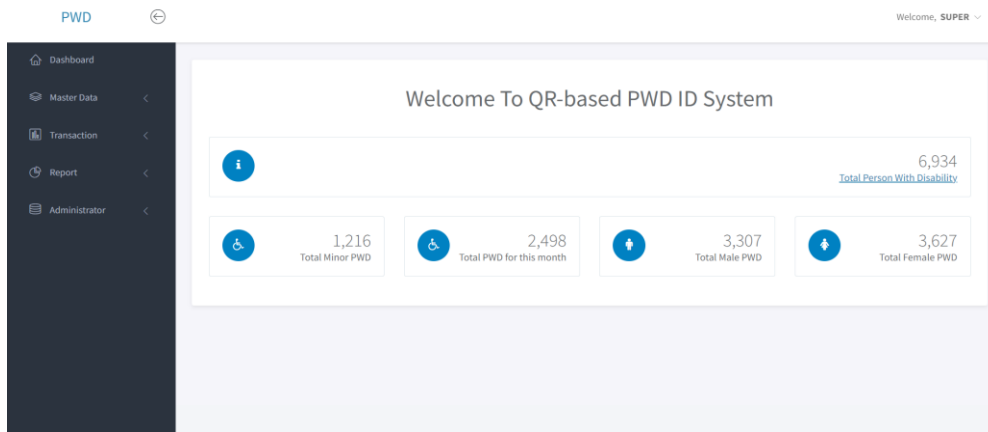


Figure 1.0 shows the Data Analysis on PWD data collected showcasing the total number of PWD, total minor, total PWD applicant for the month and total male and female PWD encoded in the system.

Figure 2.0 Generation of PWD ID

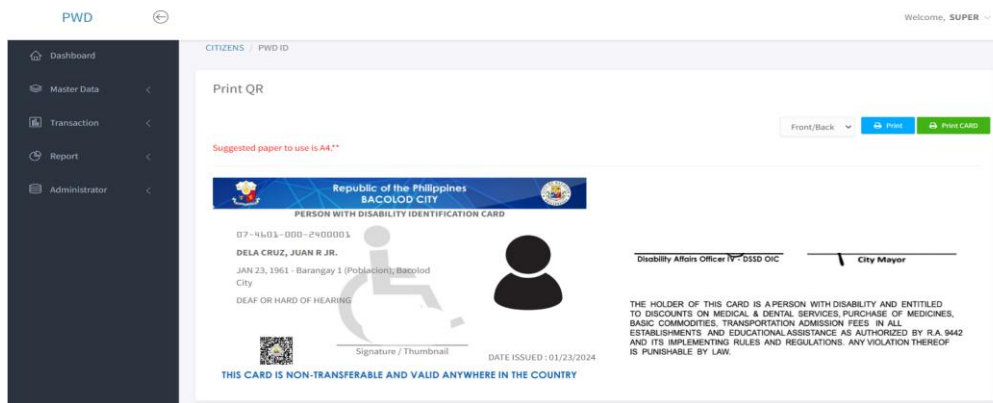


Figure 2.0 shows the generated QR-based PWD ID together with the necessary details of the PWD and signed by the DSSD Head and the City Mayor of Bacolod.

Figure 3.0 QR Validation

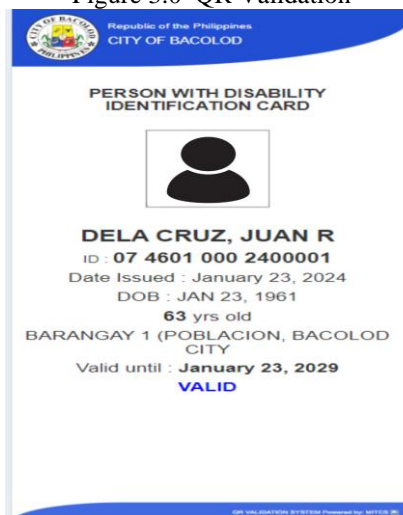


Figure 3.0 shows the screenshot of the valid PWD details once QR on the PWD IDs were scanned using an android or IOS mobile device. QR validation also displays if the PWD ID is valid or not, together with the date of issuance of the PWD ID and the validity date.

At the beginning of the client satisfaction evaluation, the researcher prepared a survey that uses Customer Satisfaction Score (CSAT) [4] to measure the satisfaction of the interaction and experience of 17 DSSD Staff with the system. The survey focuses on evaluating the functionality, reliability, usability, efficiency, maintainability and security of the system. Having 1 to 5 likert scale value was used in the 6 items satisfaction survey as shown in table 1.0 and 2.0.

Table 1.0 DSSD Staff User Experience

Question	Mean	Description
Rate your experience using the QR-based PWD ID system?	4.65	Very Satisfied
How dependable is the QR-based PWD ID system?	4.47	Very Satisfied
How easy was it to use?	4.70	Very Satisfied
How quickly and smoothly save your data in the system?	4.65	Very Satisfied
How easy was it to find what you were looking for on the system?	4.70	Very Satisfied
How secure is the system for you?	4.53	Very Satisfied
Overall Mean	4.62	Very Satisfied

Based on the client satisfaction survey [10] conducted by the researcher to PDAO staff who are involved in encoding of PWD details, generation and printing of QR-based PWD ID. Most of the staff had a very satisfied experience using the QR-based PWD ID system. They also find the system to be dependable, reliable, efficient and easy to use. The staff responded that they are confident with the security of the system and the system is user friendly.

As a result, the QR-based PWD ID system helps ease the process of obtaining PWD ID and will reduce the instances of fraud and identity theft. Its more enhanced security feature will ensure the integrity and authenticity of the PWD IDs. QR scanning devices will enable government agencies, business and service providers to verify PWD IDs which didn't exist before. This will ensure that PWD individuals will receive the necessary support and services that they are entitled to. It will also increase public trust and confidence in government services and health care facilities.

IV. DISCUSSION

Implementation of this QR-based PWD ID system should be accompanied with a City Ordinance containing the implementing set of rules, penalties for use and production of counterfeit PWD IDs for individual or business establishments and assigned regulatory buddies to monitor the misuse and creation of counterfeit PWD IDs. Careful and precise information dissemination should also be conducted by the City Government of Bacolod to make sure that business establishments will have the access to verify if the PWD ID presented is fake or not. The card holders should also have the idea of the process in availing the new ID.

V. CONCLUSION

The QR-based PWD ID system was designed to centralize data of PWD members and provide a secure, accessible and authenticity of PWD IDs. It also aims to lessen the processing time of PWDs in obtaining the card. This will also give more time for the concerned agency to verify new PWD card applicants by checking the attached supporting documents.

This new process will benefit the legitimate PWD member to be given the rightful claim to their benefits that came along with their PWD IDs and will also protect the interest of the business establishment to provide services for PWDs and will not be abused by counterfeit PWD ID card holders.

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