Electronic government: National Online Application System in Papua New Guinea

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Abstract

Digital technologies are increasingly transforming e-government services worldwide, enhancing the efficiency and effectiveness of educational service delivery. In Papua New Guinea (PNG), the Department of Higher Education, Research, Science, and Technology, in collaboration with PCG Academia, has developed the National Online Application System (NOAS) to streamline the application process for grade twelve students seeking admission to higher education institutions. This paper examines the NOAS initiative, providing an overview of higher education in PNG, the challenges of the traditional application process and the transition to a digital system. It discusses the NOAS implementation, its integration with the National Online Selection System (NOSS), and its resulting benefits for students and institutions. The paper concludes with recommendations for improving the system and future development pathways.

Keywords: backup choices, Department of Higher Education, Research, Science and Technology, non-school leavers (NSLs), school leavers (SLs), grace period, higher education, Information and Communication Technology, manual application process, National Online Application System, National Online Selection System, PCG Academia.

Introduction

The transition from manual to digital processes in educational systems worldwide has significantly enhanced efficiency and accessibility. In Papua New Guinea (PNG), the introduction of the National Online Application System (NOAS) marked a pivotal shift in how applicants (Grade 12 school leavers (SLs) and non-school leavers (NSLs)) apply for tertiary education. This paper explores the various facets of the National Online Application System (NOAS), its integration with the National Online Selection System (NOSS), and its overall impact on higher education in PNG.

In collaboration with PCG Academia, the Department of Higher Education, Research, Science, and Technology (DHERST) developed an online platform to streamline the application process for applicants seeking admission to higher education institutions. This paper examines the National Online Application System (NOAS), developed through this partnership. It provides an overview of higher education in PNG, the traditional manual application process, the challenges associated with the manual system, and the implementation and advantages of NOAS. Additionally, it examines the system's integration with the National Online Selection System (NOSS) and concludes with recommendations for improvement and considerations for the future.

Higher education in Papua New Guinea

Higher education is an important sector for national development in PNG (DHERST, 2018c). Higher education in PNG has evolved over the years, facing various challenges, including limited access, logistical hurdles and inefficiencies in application and selection processes.

Traditionally, Grade 12 students aspiring to enter tertiary institutions had to navigate a cumbersome manual application system.

DHERST

DHERST is the government agency responsible for overseeing higher and technical education in PNG (DHERST, 2015b). Its mandate includes policy development, institutional accreditation and the facilitation of tertiary education applications and selections. It collaborates with various government agencies and partners to promote skills, knowledge and innovation for sustainable development. Its vision is to drive economic and social growth through education, while its mission is to enhance the quality, access and relevance of education and research through effective policies and support systems. The introduction of NOAS is part of DHERST's broader strategy to modernise and streamline educational processes and improve service delivery.

DHERST's strategic plan focuses on transforming, reforming and unifying the higher education system to improve the quality of education (DHERST, 2015a). It aims to benefit PNG's social and economic development by enhancing programs offered by higher educational institutions. The plan also seeks to maximise student entry into universities and colleges and ensure their success by implementing strategies that help students achieve their educational goals.

DHERST's responsibilities include facilitating the SLs' applications for admission to higher education institutions (HEIs), aiming to enhance the process to ensure quality and equality in application choices (DHERST, 2024b). It also strives to improve transparency and accountability and increase the chances of capable and eligible students being admitted, while preserving the autonomy of institutions in their selection process (Papua New Guinea Today, 2017). To address challenges in the manual application process, DHERST launched an initiative in 2018 to develop an online system to streamline and improve the application process (DHERST, 2018b).

Manual application process

Before the introduction of NOAS, SLs had to complete paper application forms by hand, which were then physically submitted to DHERST (PNG Insight, 2023). The process of applying to programs at their preferred HEIs was entirely manual (Figure 1). DHERST distributed printed school leaver forms (SLFs) to national high schools, secondary schools and others offering secondary education, where guidance officers discussed academic performance, program preferences and eligibility with students. Students filled out the forms using their internal results and returned them to the school, which forwarded them to DHERST. Selectors from various HEIs then travelled to Port Moresby to choose their first-year students based on the student's choices and academic performance (Daniel, 2020). The selection lists were published in daily newspapers such as The National and Post Courier.

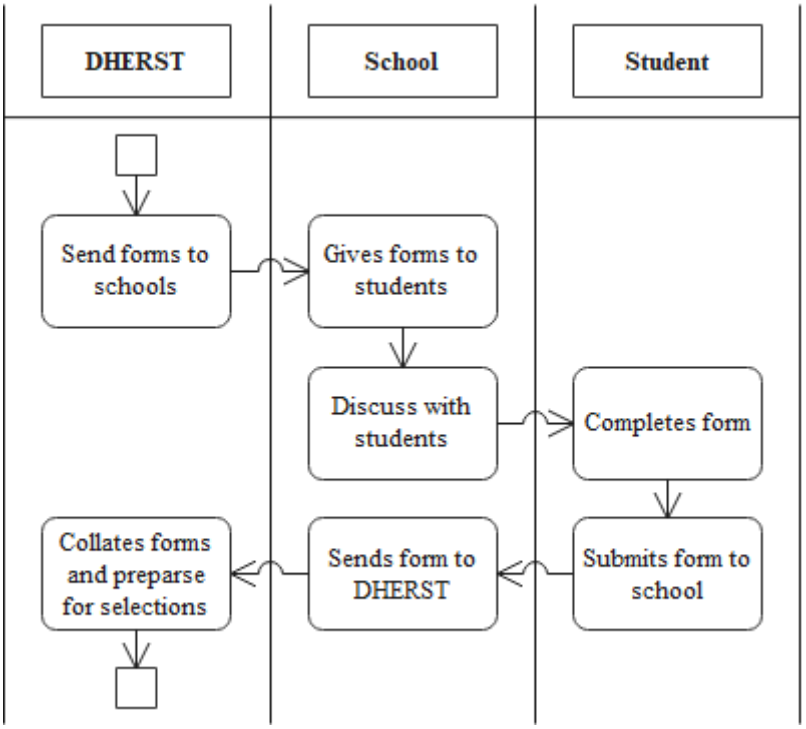

Figure 1: A model that shows how the paper-based application process works based on a student's internal results and preferred institutions.

Issues with manual application process

The manual process faced various issues including limited choices (Figure 2).

Figure 2: Issues with the paper-based application process

Students had limited options when filling out paper forms, which resulted in poor alignment between their choices and the programs offered by HEIs, leading to a low likelihood of selection for SLs (Daniel, 2020). Further, many SLs often underestimated or overestimated their academic potential and applied for programs for which they did not meet the academic requirements, ultimately missing out on opportunities in less selective programs. Some candidates with high GPAs opted for easier programs, while the manual selection process often overlooked more qualified candidates (DHERST, 2018c). Moreover, SLs had limited time to discuss their options with parents and guidance officers before submitting their forms to DHERST. They could not make changes after the forms were submitted.

SLs completed the forms before the national examinations, which prevented them from adjusting their choices afterwards. This situation resulted in misjudgements regarding their academic potential and incorrect program selections, highlighting the need for a national online application system. There were also delays in submission and processing, the risk of applications being lost or misplaced, a lack of real-time updates and feedback for SLs, and unequal access for students in non-urban areas. It was also costly and resource-intensive, as it involved printing and compiling a significant amount of paperwork. The forms were then mailed to schools nationwide.

National Online Application System

In December 2018, DHERST introduced the NOAS, developed by PCG Academia, which has extensive experience in developing information systems for student admissions and management across various institutions globally (DHERST, 2018c; Post Courier, 2017a, 2017b). DHERST engaged PCG Academia to develop the system to enhance the application process for SLs seeking to study at HEIs. This system allows SLs to apply online to attend a nationally registered HEI and specify their program preferences at their chosen institutions (DHERST, 2018a; DHERST, 2024b). “This is a new and better method to apply for further studies at any nationally registered university of higher education institution” (DHERST, 2018a, para 1). NOAS has replaced the traditional paper school leaver forms (DHERST, 2021; The National, 2020).

NOAS streamlines the application process for SLs seeking admission to higher education institutions (HEIs), enhances efficiency, and promotes equality and equity throughout the application and selection processes (DHERST, 2021). It addresses and mitigates the challenges faced by misinformed applicants and reduces instances of unfair selection. Since 2018, more than 27,000 students have submitted their applications using the NOAS.

NOAS on Google Cloud Platform

DHERST maintains an account with Google on its cloud platform to host its online services, which include NOSS and NOAS (Figure 3) (DHERST, 2021). Google Cloud Platform (GCP) is a set of cloud computing services that allow users to build, deploy and scale applications, websites and services using the same Google infrastructure (Google, n.d; Knox, 2024).

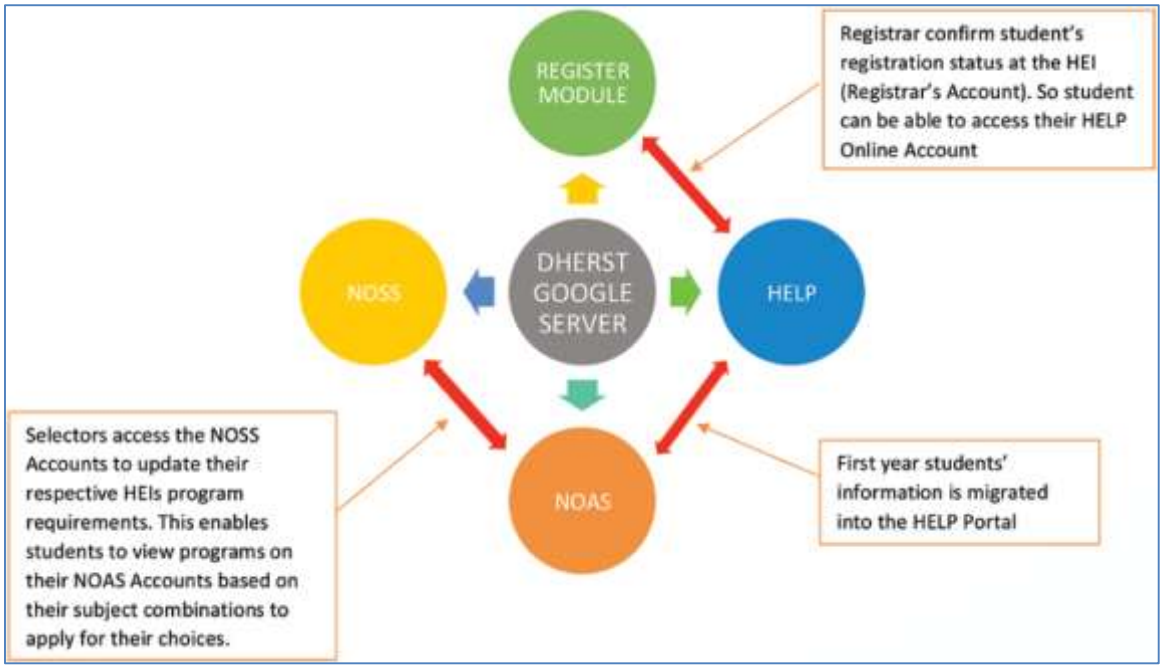

Figure 3: NOSS and NOAS servers on Google Cloud Platform
Source: https://web.dherst.gov.pg/images/2021-pubs/150621-ministerial-press-statement.pdf

DHERST operates two servers (application and database) hosted on the GCP (DHERST, 2021). One server runs the database software that stores NOSS/NOAS data, while the other hosts the web server for the NOSS and NOAS applications. Selectors use the NOSS to update their respective program requirements, allowing students to view programs on their NOAS accounts based on their subject combinations when applying for their preferred choices. DHERST then utilizes the NOSS to facilitate online selections (Daniel, 2022).

Integration with the National Online Selection System

NOAS is seamlessly integrated with the NOSS. This ensures that applications are processed and selections are made efficiently. NOSS uses a standardized algorithm to select applicants based on academic performance, subject combinations, choices and available spaces in tertiary institutions (Daniel, 2020).

SLs submit their choices through the NOAS. In 2024, NSLs were requested to apply through the NOAS but there were issues as will be discussed. Their academic results are provided by the Department of Education (DoE) to DHERST (PNG Insight, 2024b; Study in PNG, 2019b) (Figure 4). The NOSS utilizes this information to conduct the selection process electronically and generate a list of students chosen for programs at their preferred institutions (Daniel, 2020). Applicants (SLs and NSLs) can view their selection results online (indicating whether they have been selected) through the NOAS, which retrieves the results from the NOSS (Study in PNG, 2019b).

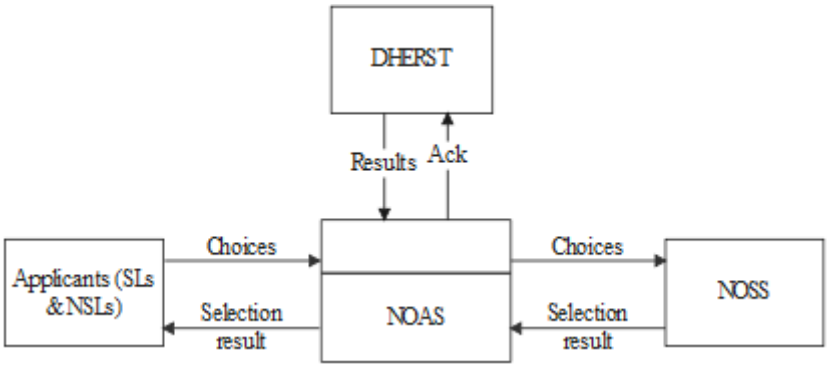

Figure 4: Integration of NOAS and NOSS. Applicants (SLs & NSLs) indicate their choices and view their results using NOAS after NOSS makes the selection.

NOAS features

NOAS provides features that aim to address the issues with the manual application process (Figure 5).

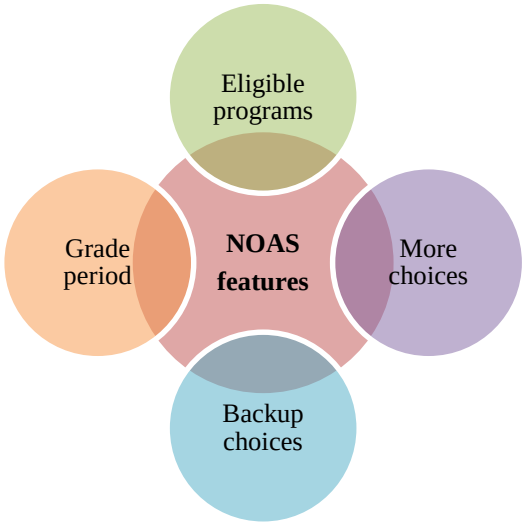

Figure 5: Some of the features of NOAS

- Eligible programmes - NOAS provides a list of programs for which applicants meet the eligibility requirements (PNG Insight, 2024a). When selecting their options, applicants can choose from this list to increase their chances of being selected.
- Increased choices - Applicants now have more options, as they can choose up to five programs at their preferred institutions (DHERST, 2018a). In contrast, the previous paper-based application process allowed SLs to choose only two programs (Daniel, 2020) while NSLs applied directly to the HEIs.
- Backup choices - In addition to selecting their top five choices, NOAS allows applications to indicate backup options. This feature enables them to be considered for alternative study programs if they are not selected for any of their initial five choices (Post Courier, 2018; Study in PNG, 2019b) These backup choices can either be similar to or different from their preferred programs, as long as the applicants meet the requirements (Daniel, 2020).
- Grace period - Applicants are usually provided a grace period of up to six days to access NOAS and finalise their program choices before the online selection is

executed (Post Courier, 2018; Study in PNG, 2019a; PNG Insight, 2024a). By this stage, SLs would already know their results, which are accessible through the National Online Results System (NORS) (https://www.mypngexamresults.com/). During the grace period, applicants have sufficient time to make informed decisions and finalize their choices (Daniel, 2020). After the grace period, the selection is conducted via the NOSS, and applicants can immediately see whether they have been selected, through the NOAS. In 2024, the grace period and online selection took place from 9 – 14 and 18 December 2024, respectively (DHERST, 2024d).

NOAS requirements

SLs need the following to apply for admission using NOAS.

- An invitation letter – This is created based on the nomination list, which includes Grade 12 students from all registered schools. This letter is provided to each student by the school principal or a designated senior teacher. Both the school and the SLs are responsible for maintaining the confidentiality of the invitation letters (DHERST, 2024b).
- Laptop or Smart Device – SLs need access to a personal computer, laptop or a smart device like a tablet, Android phone or iPhone. If the school has a computer lab with Internet access, students can utilize the lab computers to complete their application (DHERST, 2024b).
- Internet Connection – The personal computer, laptop or smart device being used must be connected to the Internet. If the student is using the school's computer lab, they should confirm with the lab supervisor to ensure Internet connectivity. For students using their devices, they can purchase data from local network providers like Digicel, Bmobile or Vodafone (DHERST, 2024b).
- NOAS Timeline – The invitation letter includes the necessary credentials to activate their online accounts. After activating their accounts, the student manual will outline the NOAS timeline and cycle activities (DHERST, 2024b). This information is also provided on the DHERST website.
- Grade 12 Students - The NOAS Student cycle for a year usually begins in August. Students can access their accounts and indicate initial choices. For further assistance, students can reach out to the NOAS student support team via email at noassupport@dherst.gov.pg (DHERST, 2024b).

NOAS typically opens in August each year for school leavers to begin the application process (DHERST, 2024a). In 2024, the NOAS was available from August to September and then in December during the grace period. To align with the PNG Government's 'leave no child behind' policy, DHERST and HEIs have established a pathway for non-school leavers (NSLs) to apply through NOAS. In 2024, NSLs were requested to contact HDERST, have their NOAS accounts activated and apply for admission into the 2025 academic year (DHERST, 2024a; DHERST, 2024c). However, as previously mentioned, there were issues with the NSL selection.

While finalising their choices, if the applicants notice a choice highlighted in red, under 'My Choices', it indicates that their results do not meet the minimum program requirements established by the institution (PNG Insight, 2024a). They need to replace the red-highlighted choices with a different program that is available in their eligible program list. They are encouraged to ensure they change their choice to a program for which their results meet the minimum requirements. If a program is not visible on NOAS, it signifies that the applicants are ineligible for that program (The National, 2020).

NOAS advantages

NOAS, in collaboration with PGC Academia, was developed to address the issues of the manual application process (DHERST, 2021). It has brought several advantages to the higher education application process in PNG (DHERST, 2018a) (Figure 6) including enhanced accessibility for students across the country, increased efficiency in application processing and selection, reduced administrative burden on educational institutions and greater transparency and accountability in the selection process. It allows students to submit applications online, view their status and receive timely updates.

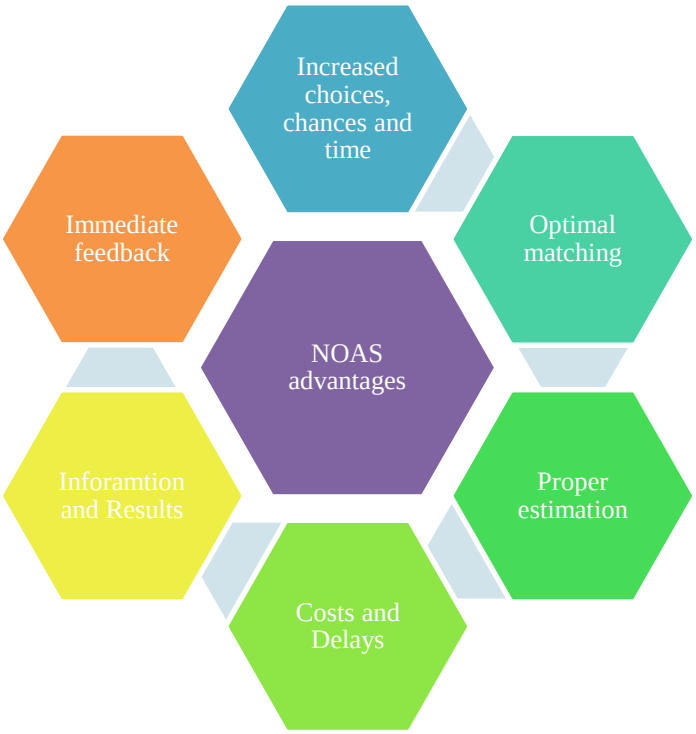

Figure 6: NOAS advantages

- Increased choices – Applicants now have more options, as they can select up to five programs at their preferred institutions (DHERST, 2018a). In contrast, the previous paper-based process allowed SLs to choose only two programs while NSLs applied directly to the HEIs as previously stated (Daniel, 2020).
- More information – Applicants now have access to more detailed information regarding the programs available at various institutions (DHERST, 2018a). Each program outlines specific requirements, preferences and residential options. Further,

NOAS displays the programs for which the applicants are eligible to apply, determined by their subject combinations and the criteria set by the institutions (DHERST, 2024a). If applicants cannot see certain programs they wish to apply for, it indicates that their subject combination does not meet the program requirements, resulting in the program not appearing (PNG Insight, 2024a). With this information, they can make more informed decisions about their choices.

- With the manual system, many SLs underestimated or overestimated their academic potential and applied for programs for which they did not meet the academic requirements. Some with high GPAs chose easier programs (DHERST, 2018c). NOAS allows applicants to make informed program choices based on their academic results and eligibility more realistically.
- More time – Applicants have more time to reach a decision, as the NOAS typically remains open for approximately three months (DHERST, 2018a). This duration allows applicants, parents and schools ample time to select the appropriate program and institution.
- Optimal matching - NOAS facilitates the alignment of program requirements with applicants' subject combinations, ensuring that applications correspond with the selected program's combinations. By matching subject combinations, the NOAS enhances the likelihood of admission by NOSS (Daniel, 2020).
- Increased chances - NOAS is transparent, efficient and cost-effective. As mentioned, it increases the chances of capable applicants being selected (Kora, 2017; Loop PNG, 2018) and ensures transparency, fairness and unbiasedness (Study in PNG, 2019b). For example, a principal in my province expressed that more students from his school were selected after the introduction of NOAS and NOSS (Daniel, personal communication, 2020), unlike in the past when applications and selections were done manually, which led to fewer choices, unfairness and nepotism (Daniel, 2020).
- Immediate feedback – Applicants can instantly find out whether they have been accepted into an institution (PCG Academia, 2017). Previously, they would wait for long periods to receive their offer letters, giving them limited time to raise school fees or secure sponsorship. With NOAS, they can view their status immediately after the online selection is conducted, giving them ample time to prepare for higher education (Post Courier, 2018).

Discussion and recommendations

NOAS brings a significant improvement in the higher education application process. It is a positive, practical, sustainable and timely initiative designed to address the issues related to the manual process. It streamlines the application process, ensuring a fair, efficient and cost-effective system. By replacing the manual process, NOAS has positively impacted academic operations, allowing capable applicants to be selected through the NOSS. It significantly reduces the logistical costs and time previously incurred by the manual selections, such as printing and distribution of forms.

NOAS has significantly increased transparency in the application process by addressing challenges associated with the manual process. It has done so by providing real-time monitoring and feedback, a standardised process for applicants, required information, guidelines and instructions, data security and integrity, reduced human intervention, visibility and equitable access to the program requirements and information.

DHERST must continue effective communication with all the institutions. This is essential to ensure that the HEI requirements in the NOSS are correct, accurate and current. These requirements must be communicated to schools, principals, guidance officers, applicants and their parents with clarity. Further, schools must supply relevant information regarding HEI program offerings and requirements to the students. They should offer adequate guidance to their students during the application process. Applicants can benefit from discussing their options with their parents, who can offer valuable advice in making their choices.

DHERST requires ongoing support from schools, applicants, principals, guidance officers, teachers, parents, HEIs, NDoE and other relevant stakeholders. Collaboration among these parties is essential to ensure that the NOAS is utilized effectively, promoting a fair and transparent application process that provides equal opportunities for suitable applicants.

Applicants must make informed decisions when choosing options through the NOAS. Timely access to their results is crucial for updating their choices or making any necessary adjustments to enhance their chances of being accepted into a program at their desired institution. Additionally, applicants should utilize the strategies mentioned earlier, such as backup choices and the grace period effectively.

DHERST should continue to provide awareness of how the NOAS operates, including its features and advantages through various media channels (like social media, television and newspapers). Necessary training may be required for schools, particularly students who may be unfamiliar with using the system. This awareness and training will help prevent misunderstandings and misconceptions.

In 2024, NSLs were required to apply through the NOAS after they had already submitted their applications to the institutions as usual. DHERST requested the institutions to submit their pre-selection lists and advise the pre-selected applicants to also apply via the NOAS. However, many NSLs did not apply as required due to various issues such as lack of communication with the NSLs. As a result, many pre-selected applicants were not selected by the NOSS. From 2025 onwards, DHERST must communicate early with the HEIs and NSLs and ensure that they apply using the NOAS so that they have equal chances of being selected. The above recommendations are necessary to ensure that this is implemented successfully.

Currently, the HEIs have limited capacity to increase their quota. The PNG Government must assist the HEIs to upgrade their facilities and increase their capacity to accommodate the increasing number of applicants applying for tertiary studies each year. Doing otherwise is

social injustice to the citizens, who deserve equal opportunities and better service delivery so that no one is left behind discriminately.

Finally, the PNG Government needs to address any challenges (e.g. limited internet access in non-urban areas and digital literacy among applicants), which require collaboration from DHERST, HEIs and the Government. The Government needs to expand the Internet infrastructure to ensure broader access, implement digital literacy programs for students and educators, establish a robust and reliable technical support system for NOAS users and conduct regular reviews and updates of the system based on user feedback. This brings out to the conclusion of the paper.

Conclusion

Digital technologies have allowed many countries to transform e-government services, improving their educational systems and providing educational services more effectively and efficiently. The PNG Government, through DHERST and in collaboration with PCG Academia, created the NOAS to enhance the educational process and facilitate online applications for applicants. NOAS has revolutionized the way applicants apply for higher education. While there are challenges to overcome, the benefits of NOAS in terms of efficiency, accessibility, security and transparency are undeniable. Continued efforts to improve the system will ensure its long-term success and contribution to the advancement of higher education.

This paper highlighted the significance of higher education in PNG, a crucial sector for the nation's socio-economic development. Delivering quality educational services can play a vital role in fulfilling some of the aspirations of the PNG Government. The paper examined the manual application process and its associated issues, such as limited options, reduced opportunities and time constraints, high costs and delays, suboptimal matching, loss and misplacement of documents, and a lack of timely feedback. It discussed the NOAS, how it works and integrates with NOSS and its advantages. Finally, it offered several recommendations aimed at enhancing the implementation and utilization of the NOAS. This initiative is viewed as a timely and beneficial advancement for the country, with the potential to significantly contribute to the nation’s socio-economic development.

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Contribution

This paper adds to the current body of knowledge by modelling technological developments in Papua New Guinea. Specifically, it documents the manual application process and its related challenges, as well as the NOAS, highlighting its features and benefits. Further, it illustrates how the NOAS resolves the issues associated with the manual process of facilitating applications for tertiary education. In this way, the paper serves as a valuable resource for future researchers in their studies.

Future paper

This paper is based on available literature about the national online application system. A future paper can discuss other aspects of the application processes not discussed in the paper.

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