Aligning University Courses to the PNG Government Digital Plan, A Challenge for the Universities in PNG

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Abstract: The Papua New Guinea Government Digital Plan 2023-2027 has set the path for its digital future agenda, focusing on transforming public service delivery, improve e-governance and build the national digital ecosystem. The Department of Information and Communications Technology (DICT) as the lead government department has developed this plan as well as supporting policy documents such as the Government Cloud Policy, Data Governance Policy, Digital Infrastructure Policy and etc. According to the plan's implementation schedule, the government wants to go paperless in 2026 and integration of AI technologies into public service systems and processes before 2027. This plan indirectly calls for and creates a demand for technically skilled labor force in emerging ICT fields like software engineering, data science, artificial intelligence, e-commerce and cybersecurity. Meeting this demand will challenge the universities in Papua New Guinea on two fronts. First is modernizing the universities themselves as institutions and integrate ICT technologies in their administration and core business of teaching and learning. This is highlighted in the Department of Higher Education, Research, Science and Technology (DHERST)'s policy document titled "Policy on Digitalization of PNG Universities Research Institutes. Second is to realign and modernize their IT program curricula to meet these digital demands in the industry. Therefore, this paper seeks to establish the status of IT related programs offered across seven universities in the country by analyzing the DHERST's 2025 Continuing Student List, of students studying in all the universities under the Tertiary Education Study Scheme (TESAS) scholarship Then the particular subject units of the respective IT programs observed from the respective institutional websites to see whether current trends in ICT like data analytics, e-commerce, software programming and AI were factored in the program subject unit structure. The results will generate informed awareness of the shortfall in IT program curriculum reform across all universities and help formulate corrective action. This will ensure the IT graduates are job ready when they enter the job market when the PNG Government Digital Plan implementation gets momentum.

Keywords: Digital Government, PNG Digital Government Plan, Course curriculum review, job readiness. IT Courses

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1. INTRODUCTION

Digital Government is as is defined as " the use of digital technologies, as an integrated part of governments' modernization strategies, to create public value" OECD (2014). As governments of countries went through the changes brought about by different stages of world industrial revolutions, their systems of governing the state have also gone through similar progression processes. According to PricewaterhouseCoopers LLP (PwC) governments have evolved from Government 1.0 to Government 5.0. Government 1.0 (emerging)-government with standalone services, with no cross department integration, Government 2.0 (industrialization)-scaled adoption of digital services ensuring access to everyone, Government 3.0 (Automation)-refining operating models

to enhance efficiency, Government 4.0-(Digitalization)-whole-of-government alignment enabling citizens to interact with government and Government 5.0-(Personalization)-" governments shift their mindsets towards the citizen models ,aligning their service delivery and government processes to citizens' lives, rather than expecting the citizens to fit into governments' processes", PwC (2022)

A lot of the Digital Government efforts by countries around the world and the Pacific region are centered around the Organization for Economic Co-operation and Development (OECD)'s Digital Government Policy Framework. This framework elaborates on six dimensions of Digital Government which are digital by design, data-driven public sector, government as platform, open by default, user-driven and proactiveness, OECD (2020-10-07). The 38 member countries of the OECD and European Union participating in it as well means the Digital Government agenda is a global one, OCED (2025).

The implementation of the agenda for developing countries is important for three obvious reasons. Firstly, OECD countries have strong political and economic ties with developing countries. Secondly, OECD members are usually the first respondents to natural and manmade national emergencies in the developing countries. For example, the COVID-19 and various earthquakes in the South Pacific Island nations. These emergency response operations are often carried out in collaboration with respective national government and local governments. Thirdly, OECD member countries contribute significantly to development aid for developing countries under various aid programs. They are also active in setting global development agendas at the United Nations like the Sustainable Development Goals (SGDs) and supporting the various UN implementing agencies. Therefore, the Digital Government outcomes will not only be of benefit to individual countries but have an impact on all countries through that kind of relationship and collaboration.

The Papua New Guinea government is transitioning into this Digital Government agenda by passing the Digital Government Act 2022 which led to the development of the PNG Digital Government Plan 2023-2027. The implementation of this plan will require a lot of digitally skilled local workforce in both the public sector as well as in the ICT industry. Therefore, the ICT industry and the public sector "counts on the universities to produce the professionals with ICT practitioner skills. These are the capabilities required for researching, developing, designing, strategic planning, managing , producing, consulting, marketing, selling, integrating, installing, administering, maintaining, supporting and serving ICT systems.", Baltac (2008). This paper aims to highlight the status of ICT courses offered across all the eight universities in the country and one private university which is soon to be registered as a university with DHERST. The main document analyzed was the 2025 Tertiary Study Assistance Scheme (TESAS) scholarship list of continuing students.[1] This document gives the national snapshot of all programs offered across the universities and number of students enrolled in them. The IT program's particular subject units also analyzed from the respective institutional website information to see whether the units relate to the current ICT industry trends such as Data Analytics, Cyber Security, E-Commerce, Artificial Intelligence, Software Engineering which are some skills sets required by the government and the ICT industry.

2. THE PNG DIGITAL GOVERNMENT PLAN

The PNG Digital Government plan sets the road map for Papua New Guinea Government's intension to digitalize how it conducts its business with its citizens (Government To Citizens-G2C), among its own departments and statutory organizations (Government to Government (G2G) and with businesses (Government to Business (G2B). The main objective of the plan is to " enhance, strengthen, and improve the performance and productivity of the public sector agencies to effectively deliver goods and services to citizens, business, and investors", the whole of Government approach, DICT (2022).

The government made the development of this plan mandatory under Section 10 of the Digital Government Act 2022 (PNG 2025). This legislation dictates that the copy of the plan is to be circulated to all government bodies and the government bodies are to comply with the plan. Also, the government bodies are obliged to conduct an annual self-assessment of implementing the plan and submit the assessment report to the Minister Department of Information and Communications Technology (DICT) as the lead department. The

department is required to review the plan every five years or as advised through a National Executive Council (NEC) decision.

All heads of government organizations are required by law to submit the annual implementation assessment report to the Department of Information and Communications Technology. Failure to do that is an offense against the act.

To support the implementation of the plan, DICT has developed supporting strategic policies that span across the key areas of the plan. For example, the Digital Economic Policy and Strategy, Data Governance Policy, Government Cloud Policy, National Broadband Policy 2022 to 2027 etc.

To initiate the implementation, the government bodies will first build their systems through a Government Leased Cloud Infrastructure provided by commercial vendors and then later build On-Premises Data Centers as outlined in the Government Cloud Policy.

The major milestone targets for the first five years (2023-2027) of this plan includes all government bodies to go paperless by 2026, become a leader in cyber security in the Pacific, government services driven by AI and have electronic voting for the upcoming 2027 National General Elections.

3. CURRENT STATUS OF ICT PROGRAMS AT UNIVERSITIES IN PNG

3.1 DHERST Policy on Digitalization

In response to the PNG Government Digital Government plan, the Department of Higher Education, Research, Science and Technology (DHERST) released its adoption policy document "Policy on the Digitalization of Papua New Guinea Universities and Research Institutes" DHERST (2025). This policy highlights how Higher Education Institutions (HEIs) can integrate digital technologies into the core business of teaching and learning, research and administrative processes. One notable component of the plan is the deployment of the National Higher and Technical Education Management Information System (NHTEMIS).[2] These and other related policies capture future aspirations and intentions to innovate and develop the digital ecosystem for higher education institutions but there is no clarity on the implementation milestones.

One evidence of such vagueness is the very low number of IT programs offered across the eight universities in the country. Although the curriculum review and update are the prerogative of the universities, clear policy milestone directives are required to invoke the necessary decisions.

3.2 Current computer programs offered by universities in PNG

The current IT related programs offered at the main universities in Papua New Guinea is very low in terms of quantity, student enrollment and choice of subject unit components in the program structures. Out of the 134 total programs offered in universities, only ten are IT programs. This equates to 7% of the total programs. In terms of student enrollments, the total enrollment in 5296 students and 331 students are enrolled in the IT programs which is 2.6%. This figure represents the enrollment figures for a period of 3 years since the DHERST 2025 TESAS Continuing list consists only of 2nd, 3rd and 4th years. So, an average of 110 students will graduate in IT programs between 2025 and 2027.

Source: https://web.dherst.gov.pg/images/2025-pubs/digitalisation-policy/MPS-202501_Digitalisation%20Policy.pdf

Institution	Total Programs	Students	IT Programs	Enrollment
Papua New Guinea University of Technology	31	1234	2	107
University of Papua New Guinea	26	277	1	13
University of Goroka	16	753		
Pacific Adventist University	16	972	1	73
Divine Word University - Madang campus	15	598	2	57
PNG University of Natural Resources and Environment	8	630		
Innovative University of Enga - Faculty of Education	6	114		
Western Pacific University	5	99	3	49
IBSUniversity	4	106	1	32
University of Goroka - Sepik Campus	2	45		
Divine Word University - St. Benedicts Campus - Wewak	2	192		
Divine Word University - OLSH Kabaleo Rabaul Campus	1	170		
Divine Word University - St. Benedict School of Nursing	1	48		
Divine Word University - St. Mary's Vunapope Rabaul	1	58		
	134	**5296**	**10**	**331**

Source: DHERST TESAS 2025 Continuing student list.

	Papua New Guinea University of Technology
1	Bachelor of Business in Information Technology
2	Bachelor of Science in Computer Science
	University of Papua New Guinea
3	Bachelor of Science (Major in Mathematics, statistics & Computer Science
	Pacific Adventist University
4	Bachelor of Business (Accounting & Information System)
	Divine Word University
5	Bachelor of Information Systems
6	Bachelor of Mathematics & Computing Science
	Western Pacific University
7	Bachelor of Science in Computer Networks
8	Bachelor of Science in Computer Programming
9	Bachelor of Science in Cyber Security
	IBSUniversity
10	Bachelor of Information Technology

IT programs offered in universities

The IBS University, Western Pacific University and Bachelor of Business and Information and Technology from PNGUoT have all subject units that related to IT. Pacific Adventist University IT Program is a Double-Major and 50% of subject units are Accounting units and other 50% subjects units are IT. University of PNG's IT program, Divine Word University's Bachelor of Mathematics and Computer Science and the Bachelor of Science program from PNGUoT are more mathematics centered to build mathematics theories around computing.

This stagnation of IT program offerings at universities had persisted for some time. One critical computer skill for ICT practitioners is programming. According to (Cheong, Abuzo et al. 2025), students are introduced to

basic introductory computer programing subject at undergraduate when they enroll for a IT program. Usually as a one-off single subject unit rather than series of units in a Software Engineering program path. As a result, there is a lack of local software developers and engineers in the ICT industry in PNG.

Sun, Wei et al. (2024) studied the digital policy, digital technologies and development of computing education trends in PNG and highlighted that development of computing education has always been influenced by support from outside like the Australian Government which supported the curriculum review of the IT program at PNGUoT. "Most of master's degree in IT are offered outside of PNG like Australia, New Zealand and other countries. Since, the arrival of internet in 1997, ICT industry is reliant on foreign companies and PNG is primarily an end user of ICT and digital technologies and services rather than a manufacturer ".

Manohar, Rao et al. (2010) emphasized the need for building the infrastructure and human resources necessary to implement e-government initiatives in PNG and concluded that "human capacity in PNG is to be geared upon on a large scale to meet the implementation and usage needs of e-government initiatives. The government should encourage academic institutions to cooperate with the ICT sector to ensure that the educational programs provide by such institutions improve the ICT skills of various job types."

Sinebare (1999) foresaw the predicament of IT education and training in Papua New Guinea and recommended "There is neither a specific policy formulated, nor a curriculum guideline provided to cater for IT education and training in PNG. IT education and training in PNG should be given national attention by the government because of the potential in using IT in many aspects of social-economic aspects of the country and more importantly because of the potential to create a knowledge industry within the country. "

4. IT PROGRAMS AT SOMARE INSTITUTE OF LEADERSHIP AND GOVERNANCE (SILAG)

As implementation of the PNG Government Digital Plan gains momentum, the IT industry, private sector and the public sector will be competing for the limited number of IT graduates from the universities. This will also require upskilling and upgrading of existing public sector workforce in IT skills. Therefore, the institution mandated with the public sector employees training is the Somare Institute of Leadership and Governance (SILAG), formerly known as Pacific Institute of Leadership (PILAG) and initially known as Institute of Public Administration (IPA).

The PNG Government has already planned it to be the elevated to a university status in 2027 Studyinpng (2024) and it will become Somare University of Public Service and start enrolling students direct from Grade 12. It will mainly offer programs related to the Government like Economics, Public Policy Development, International Relations and etc., (Studyinpng 2025). The current IT programs on offer at SILAG is almost the same state as the university programs. It has only one program called Diploma in Information Technology SILAG (2023). It does not have offer a IT program tailored for public sector IT leaders. Also, it doesn't have any IT industry certification programs like Microsoft Certification, Cisco Network Certification etc.

5. NEED FOR IT PROGRAM CURRICULUM REVIEW AT UNIVERSITIES IN PNG.

Universities and SILAG as public sector training institute and upcoming university has a crucial role to play to prepare the necessary skilled IT labor force that will be required for the successful implementation of PNG Digital Government Plan. "Universities have a distinct role in producing the professionals needed by the ICT industry and they have to continue to strengthen their vital role in this respect" .Baltac (2008).

Proactive curriculum review is required from the universities to address the current low IT program offering at both the universities and at SILAG. "PNG nationals urgently require IT education and training from educational institutions to meet the country's increasing needs. Computer education and computer studies have been left to chance", Kelegai and Middleton (2002).

Curriculum can influence three elements. Teacher, student and environment. For example, a change in curriculum may require a new teacher expertise, it may also call for environment change in academic environment like computer labs, facilities and etc, Pumwa (2013).

European Union (EU), America and Asian countries are competing for top IT talents to maintain their economic and political status quo, Baltac (2008). And PNG's top cream of young intellectuals from the School of Excellence are being send overseas through the STEM scholarship program, PostCourierOnline (2024) and potential for brain-drain of PNG's talented future workforce is real. Therefore, universities need to critically relook at their IT program curriculums and align to the PNG Government Digital Plan.

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