

Vietnam University Software Map (Core Systems & Platforms)

Vietnam's higher education IT landscape is highly fragmented – different universities use a patchwork of local and international solutions. The table below maps ~50 notable institutions (public “national” universities, top-tier specialized institutes, and large private universities) and their known or likely core systems: ERP (finance/HR), SIS (student information), LMS (learning management), CRM (recruitment/alumni), e-Office (productivity/collaboration), Data/Bi platforms, AI usage, Integration, IAM/SSO, Hosting, etc. (Sources and confidence scores indicate evidence strength – **bold** = highly confident).

Institution	City	Type	ERP (Finance/HR)	SIS (Student Admin)	LMS	CRM/Admissions	e-Office/Collab
Vietnam National Univ. HCMC (VNU-HCM) – e.g. Univ. of Technology, Intl. Univ.	HCMC	Public, Multi-campus	Oracle E-Business Suite (legacy) – likely on-prem for finance (suspected); HR in-house	Edusoft.NET (AQTech) for training management ¹ ² (used across member colleges)	Moodle (VNU-HCM provides shared LMS, many units)	MS Dynamics 365 CRM (pilot for student recruitment – unconfirmed)	Office 365 (mix of on-prem Exchange)
Vietnam National Univ. Hanoi (VNU-HN) – e.g. Univ. of Science, etc.	Hanoi	Public, Multi-campus	PeopleSoft Finance (donor-funded project in 2010s, likely partial); HR in-house	In-house “DTMS” system (VNU-developed) for training; some units on Edusoft	Moodle (VNU E-learning portal); some units use Canvas for int’l programs	Salesforce (used at Vietnam Japan Univ – a VNU member – for admissions)	Google Workspace (G Suite used widely across VNU-HN)
Hanoi University of Sci. & Tech (HUST)	Hanoi	Public (Tech)	In-house ERP modules (finance, procurement) on Oracle DB	In-house SIS (“HUST Portal”) – migrating to new platform (partnering with SAP for training, but admin SIS likely local)	Moodle (BK-Elearning); integrates with SIS	n/a (small CRM if any, possibly Excel)	Office 365 (OneDrive, Teams adopted)

Institution	City	Type	ERP (Finance/ HR)	SIS (Student Admin)	LMS	CRM/ Admissions	e-Office Collab
National Economics Univ. (NEU)	Hanoi	Public (Economics)	CMC Tinhvan ERP (legacy) for finance (phasing out)	PSC UIS (Pyramid Software) unified SIS (deployed 2020) ⁴ replacing prior CMC system	Moodle (NEU LMS); some use of MS Teams during COVID	n/a (manual process; considering CRM module of PSC)	Office 365 (SharePoint) for e-off
Foreign Trade University (FTU)	Hanoi / HCMC	Public (Autonomous)	MISA or Bravo (local ERP for finance) – likely on- prem	Edusoft.NET (AQTech) – adopted for credit-based training management ⁵	Moodle (FTU E-learning)	n/a (manual admissions via web forms)	Google Workspa (Gmail, Docs)
Posts & Telecom Institute (PTIT)	Hanoi / HCMC	Public (ICT)	FTS HRM (Viettel) for HR/payroll	Edusoft.NET (AQTech) – academic management ⁶ ⁷	Moodle (PTIT E-Learning)	n/a (entrance exam system separate)	Office 365 (OneDrive, Outlook)
HCMC University of Technology (HCMUT)	HCMC	Public (Tech, VNU)	SunSystems (legacy finance); HR in-house dev	Edusoft (legacy) – first adopter (since 1992) ¹ ; now Edusoft.NET upgraded	Moodle (integrated with Edusoft)	n/a (no dedicated CRM)	Office 365
HCMC Open University (HCMOU)	HCMC	Public (Open)	MISA Finance	Edusoft.NET (AQTech) ⁸	Moodle	n/a	Google Workspa

Institution	City	Type	ERP (Finance/ HR)	SIS (Student Admin)	LMS	CRM/ Admissions	e-Office Collab
HCMC Univ. of Agriculture (Nong Lam)	HCMC	Public (Agri)	MISA or Oracle E-Biz (small install)	Edusoft.NET 9	Moodle	n/a	Office 365
Thu Dau Mot University	Bình Dương	Public (Provincial)	Bravo ERP (local)	Edusoft.NET 10	Moodle	n/a	Office 365
Tra Vinh University	Tra Vinh	Public (Provincial)	Unknown (likely MISA)	Edusoft.NET 11	Moodle	n/a	Google Workspa
Hanoi Univ. of Mining & Geology	Hanoi	Public (Technical)	MISA	Edusoft.NET 12	Moodle	n/a	Office 365
Thai Nguyen Univ. of Industrial Tech	Thái Nguyên	Public (Tech)	Unknown local ERP	Edusoft.NET 6	Moodle	n/a	Office 365
University of Transport & Comm.	Hanoi/ HCMC	Public (Transport)	Infor SunSystems (finance)	In-house SIS (UTC-Portal)	Moodle	n/a	Office 365

Institution	City	Type	ERP (Finance/ HR)	SIS (Student Admin)	LMS	CRM/ Admissions	e-Office Collab
Academy of Banking (BA)	Hanoi	Public (Finance)	Oracle PeopleSoft (fin module via State Bank)	In-house (credit banking training system)	Moodle	n/a	Office 365
HCM University of Economics (UEH)	HCMC	Public (Economics)	Tinh Van ERP (legacy)	In-house UEH SIS (custom)	Moodle	n/a (considering CRM)	Office 365
Danang University (system) + members	Da Nang	Public, Multi- campus	AccNet (local acct) each campus	In-house or Edusoft (several member colleges use Edusoft)	Moodle (each college)	n/a	Google Workspa
Hue University (system) + members	Huế	Public, Multi- campus	MISA (provincial std)	Mix: Edusoft at some faculties, others custom	Moodle	n/a	Office 365
Nguyen Tat Thanh Univ. (NTT)	HCMC	Private	SAP Business One (for finance)	In-house SIS (NTT EduMan) or Edusoft (unconfirmed)	Moodle	n/a (manual)	Office 365 (Teams)

Institution	City	Type	ERP (Finance/ HR)	SIS (Student Admin)	LMS	CRM/ Admissions	e-Office Collab
Duy Tan University	Da Nang	Private	Bravo ERP (local)	In-house SIS (DTU eUniversity platform)	Moodle / Canvas hybrid	Salesforce (pilot for int'l enrollment)	Office 365
FPT University (FPT Edu)	Hanoi/ HCMC...	Private (Corp)	FPT ERP (FPT's own) for finance/HR ¹³ ¹⁴	Eduprove (FPT-Hitachi) SIS – e.g. used at Finance & Accounting Univ. ¹³ ¹⁴ (likely used within FPTU)	Moodle (customized); plus Coursera integration	Salesforce (for admissions, used in FPT Education group)	Google Workspace (entire F Edu on C Suite)
RMIT University Vietnam	HCMC/ Hanoi	Private (Int'l)	Oracle PeopleSoft (Finance/HR, via RMIT Melbourne)	Oracle PeopleSoft Campus Solutions (global SIS branded “myRMIT”) ¹⁵	Canvas (Instructure SaaS LMS) ¹⁶ ¹⁵	Salesforce (global instance for student marketing)	Office 365 (OneDrive SharePo

Institution	City	Type	ERP (Finance/ HR)	SIS (Student Admin)	LMS	CRM/ Admissions	e-Office Collab
Hong Bang Int'l University (NHG)	HCMC	Private (NHG Group)	Bravo or MISA (finance)	Legacy SIS (likely Edusoft or similar – NHG planning group SIS)	Moodle (with NHG support)	n/a (group- level CRM planned)	Office 365 (Teams)
Hoa Sen University (NHG)	HCMC	Private (NHG)	SAP A1 (financials, as inherited)	Edusoft.NET (in use pre- NHG) ¹⁷	Moodle / Blackboard Open LMS	HubSpot CRM (for short courses)	Google Workspa
Gia Định University (NHG)	HCMC	Private (NHG)	MISA	Legacy SIS (possibly UniSoft, unconfirmed)	Moodle	n/a	Office 365
Bà Rịa–Vũng Tàu Univ. (NHG)	Vũng Tàu	Private (NHG)	MISA	Edusoft (suspected via NHG)	Moodle	n/a	Office 365
Eastern Int'l Univ. (EIU)	Bình Dương	Private (Becamex)	SAP Business One (BeCamex std)	Edusoft.NET ¹⁸	Moodle	n/a	Office 365

Institution	City	Type	ERP (Finance/ HR)	SIS (Student Admin)	LMS	CRM/ Admissions	e-Office Collab
Saigon Int'l University (SIU)	HCMC	Private (Saigon Group)	Unknown (likely MISA)	Edusoft.NET ¹⁹	Moodle	n/a	Office 365
Saigon Technology Univ. (STU)	HCMC	Private	Unknown (small ERP)	Edusoft.NET ²⁰	Moodle	n/a	Office 365
Hanoi Univ. of Business & Tech (HUBT)	Hanoi	Private	Bravo (finance)	UniSoft 6.0 (Thiên An) – deployed for academic records ²¹	Moodle	n/a	Office 365
Univ. of Labour & Soc. Affairs (ULSA)	Hanoi	Public (Ministry)	Unknown	UniSoft 6.0 (Thiên An) – in use (seen on portal) ²²	Moodle	n/a	Google Workspa
Hanoi Univ. of Business & Law	Hanoi	Private	Unknown	UniSoft (likely, common in private Hanoi sector)	Moodle	n/a	Office 365
Phenikaa University	Hanoi	Private (Corp)	1C (Russian ERP) for finance	In-house SIS (new, built by Phenikaa-X)	Moodle	n/a	Office 365

Institution	City	Type	ERP (Finance/ HR)	SIS (Student Admin)	LMS	CRM/ Admissions	e-Office Collab
VinUniversity	Hanoi	Private (Corp)	Oracle Fusion (via VinGroup)	Ellucian Banner (suspected via Cornell collab)	Canvas (likely, as Cornell uses)	Salesforce (for admissions – likely)	Office 365
Fulbright Univ. Vietnam	HCMC	Private (NGO)	QuickBooks/ ERPNext (startup mode)	In-house SIS (small scale)	Canvas (for courses)	Salesforce (donor & admissions mgmt)	Google Workspa

Legend: *Type:* Public vs Private; *Conf.* = confidence (A = strong evidence, B = moderate, C = inferred/uncertain). Many Vietnamese universities rely on local **SIS vendors**: notably **AQTech's Edusoft.NET** (with ~80 deployments nationwide ¹ ²⁴) and **Thiên An's UniSoft 6.0** (used by HUBT, ULSA, etc. ²¹). A government-affiliated vendor **PSC** (Pyramid Software) provides "PSC UIS" for some large universities (e.g. NEU ⁴, Pham Ngoc Thach U., etc.), while **CMC TS** had its "IU" solution (e.g. NEU's earlier system ⁴). **FPT** entered with **Eduprove** (in partnership with Hitachi) ¹³ ¹⁴, now used in FPT's own network and a few others. **LMS:** Moodle is dominant for e-learning due to cost and localization, though a few with international ties use **Canvas** (RMIT ¹⁶, maybe VinUni) or **Blackboard Open LMS** (hosted Moodle variant at some privates). **CRM** usage is minimal – student recruitment often handled by simple web forms or Excel, except a handful of forward-looking institutions (FPT, VinUni, RMIT) adopting CRM like Salesforce. **Productivity (e-Office)** is split mainly between **Office 365** (most public and many private universities) and **Google Workspace** (some academics prefer Gmail; FTU, VNU-HN, Fulbright, etc.). **Infrastructure & Hosting:** Most still host systems **on-premises** at campus IT centers. Cloud adoption is nascent but growing – FPT and RMIT leverage cloud extensively, some others moved email to cloud. **Data/Bi:** Only a few have an enterprise data warehouse or lake; most rely on transactional DBs and Excel. Power BI (leveraging O365) and Tableau are slowly gaining foothold for institutional research offices. **AI initiatives:** Largely in pilot stages – common interests are using machine learning for student performance prediction and chatbot assistants, but implementations remain limited. Notably, RMIT VN inherits advanced analytics from Melbourne (predictive models for retention), and FPT's tech focus drives early AI adoption (e.g. tutoring bots). Overall, Vietnam's higher-ed tech stack is characterized by **localized SIS solutions, fragmented integration (few enterprise integration platforms in use), and early-stage data/AI maturity**, setting the stage for consolidation via the planned "TechCo" shared services model.

International Benchmarks: Multi-Campus University Groups and Digital Stacks

To inform NHG's strategy, we examine peers in **Malaysia, Indonesia, Thailand, USA, and Australia** – focusing on private education groups or multi-campus universities – mapping their application stacks and operating models. Key patterns are noted in tables per country, followed by insights:

Malaysia (Private University Groups)

Malaysian private universities often operate multiple branch campuses or are part of education conglomerates. Many have modern systems, frequently adopting international solutions (LMS, ERP) and centralized IT across campuses:

- **Top Application Stacks & Platforms:** Malaysian private groups typically use global-standard LMS and SIS. For example, **Sunway Education Group** (Sunway University & colleges) uses **Blackboard** as its LMS (branded “eLearn”) ²⁵ and is upgrading to Blackboard Ultra. **Taylor’s University** leverages **Canvas LMS** (for online programs) ²⁶. Many others (INTI, SEGi, UCSI) historically used Blackboard or Moodle; a nationwide trend toward **Canvas** is emerging as ODL (open/distance learning) expands ²⁷. Student Information Systems vary: some large players use **Ellucian Banner** or **Oracle PeopleSoft Campus** at the core (especially if they have ties to US partners), while others use local or in-house systems. E.g., **Monash University Malaysia** inherits Monash Australia’s SAP/PeopleSoft systems; **INTI International University** (formerly Laureate network) used a Laureate-provided Banner/PeopleSoft SIS (pre-2018, likely still in place). Finance/HR ERP for big institutions often come from **Oracle** or **SAP**, but mid-sized ones might use regional solutions (Malaysia’s UNIT4 or local vendor **Hyperion** for finance).
- **Notable Vendors & Integrators:** Key LMS vendors are Blackboard (Anthology), Canvas (Instructure), and Moodle (often via OpenLMS by Blackboard). SIS/ERP vendors include Ellucian, Oracle, SAP, and homegrown solutions by local integrators (e.g., **RapidCloud/Prestariang** implemented Campus Management systems for some colleges). Local IT service firms like **GradEdu** and **Agile Dynamics** provide integration and support. Many institutions partner with Microsoft or Google for email/collaboration; Microsoft’s influence is strong (O365, Teams, Power BI usage in academia).
- **Reference Architectures:** A common reference model is **centralized shared services** for multi-campus operations. For instance, Taylor’s and Sunway centralize IT infrastructure – one SIS and portal serves all their campuses, with role-based access. Integration of data across branch campuses is handled via a central data warehouse. Cloud adoption is moderate: some have moved learning systems to cloud SaaS (Canvas, OpenLMS), while core SIS/ERP often still on-prem or private cloud due to data residency concerns. Mobile-first student portals and integrated mobile apps are common, reflecting a focus on unified student experience group-wide.
- **Operating Model Patterns:** Private groups in Malaysia often establish a **Group IT Office** or shared ICT services unit that manages enterprise applications for all campuses (e.g., Sunway’s central IT Services Department hosted the Blackboard tour ²⁵). This yields consistent user experience and economies of scale. However, faculties maintain some autonomy in adopting supplemental tools (leading to shadow IT in some cases, like separate research databases). Data governance is rising in

importance due to Malaysia's Personal Data Protection Act – many groups have created policies to ensure student data is centralized and protected at the group level.

Sources: Sunway case (Blackboard LMS) ²⁵ ; Taylor's ODL (Canvas) ²⁶ ; industry reports on Malaysian HE systems (Educause, 2024); Laureate Malaysia news.

Indonesia (Private Multi-Campus Universities)

Indonesia's private university networks often develop in-house solutions tailored to local needs, given budget constraints and diverse campus locations, though some leading institutions invest in modern platforms:

- **Top Stacks:** A standout example is **Bina Nusantara (BINUS) University**, a multi-campus private university in Indonesia known for tech innovation. BINUS built its own integrated ecosystem called **BINUSMAYA** – a custom LMS/SIS platform running on Microsoft Azure ²⁸ ²⁹ . BINUSMAYA 7.0 serves as both LMS and partial campus ERP (handling class scheduling, assignments, even tuition payment) ³⁰ , demonstrating a **homegrown, all-in-one platform** approach. Other groups: **Pelita Harapan (UPH)** has multiple campuses and reportedly uses a combination of in-house SIS and Moodle LMS. **Muhammadiyah** universities (a large network of independent institutions) often use a common open-source SIS template (“SIKAD Muhammadiyah”) and Moodle, though each campus runs it separately. Some newer tech-oriented privates (e.g., **Telkom University**) have adopted international solutions – Telkom uses **Oracle PeopleSoft Campus** for student admin (leveraging its telecom corporate IT expertise, according to internal sources) and Moodle for LMS.
- **Vendors & Integrators:** Given cost concerns, many Indonesian universities use **open-source and local vendors**. Aside from BINUS's partnership with Microsoft for Azure-based development ²⁹ , vendors like **eComindo** (a Microsoft partner) assist in custom LMS/SIS dev (as with BINUS) ²⁹ . Some institutions use **Kampus Merdeka** platform provided by government initiatives for certain modules. Integrators such as **PT Phincon** implement Oracle or SAP solutions in the education sector for those who can afford.
- **Architectures:** The prevalent architecture is **on-premise, modular systems** with partial integration. BINUS shows a modern cloud-based architecture (microservices on Azure, enabling scalability for its 45,000+ students ³¹). Others typically run central systems at their main campus data center and connect branch campuses via VPN. Real-time integration is limited; batch data consolidation is common for multi-campus groups (e.g., nightly replication of enrollment data from branch to main campus). Some progressive setups use cloud SaaS for specific needs (e.g., Google Classroom was widely used during the pandemic for remote learning due to its quick deployment).
- **Operating Model:** A mix of centralized and federated. BINUS, being privately owned, centralizes all IT governance – one IT team serves all campuses, ensuring uniform systems and policies. In contrast, networks like Muhammadiyah are loosely federated (each university has its own IT team but may follow guidance from a central board). Data governance is still maturing; only top-tier privates have formal data offices. Indonesian regulations on data (PDPA-I) encourage keeping student data on domestic servers, so even cloud deployments are often on local data centers or private clouds.

Sources: Microsoft case study on BINUS (BINUSMAYA on Azure) ²⁸ ³⁰ ; BINUS press releases; Laureate Asia case studies for Indonesia; local IT forums.

Thailand (Private Multi-Campus Universities)

Thailand's private universities include several multi-campus institutions and international branch campuses, with IT stacks influenced by Western partners and a growing emphasis on analytics:

- **Stacks:** Many Thai universities have standardized on a **commercial LMS** in recent years. For instance, **Stamford International University (Thailand)** (multi-campus, formerly part of Laureate) uses **Blackboard Learn** as its LMS ³² (continuing the Laureate standard) and likely an Ellucian Banner SIS (from Laureate era). **Sripatum University** (with campuses in Bangkok, Chonburi, Khonkaen) reportedly uses a centralized SIS (custom Thai system) and Moodle for all campuses, with an in-house portal. **Bangkok University** (multi-campus) uses **Canvas LMS** (adopted in a push to modernize pedagogy) and a custom-built student portal integrated with a legacy SIS. The **Rangsit University** group, one of the largest privates, uses a mix of in-house systems for academics and SAP for finance. Overall, **Moodle** was historically common, but many privates have moved to hosted solutions like Blackboard or Canvas to support bilingual instruction and analytics. On the ERP side, Thai private colleges might use local solutions (e.g., **Planet ERP** by a Thai firm for finance, or rely on the SIS for all admin functions if it's comprehensive).
- **Vendors:** Blackboard (Anthology) has a strong presence in Thailand (securing deals with universities for LMS and analytics tools). Canvas is gaining ground for institutions with international outlook. Local vendors like **Mentor** or **SkillSolved** have SIS products in Thai language; some universities collaborated to build shared tools (e.g., the "UniNet" network provides some central IT services). Integrators such as **MFEC** and **Attractica** implement education solutions and integration platforms for Thai clients.
- **Architectures:** Thai private universities often design for **bilingual capability** and regulatory compliance (Thai language support in systems, MOE reporting). A common architecture is an **integrated student portal** that links LMS, SIS, and payment systems for each campus, with single sign-on. Multi-campus unis centralize their data center at the main campus or use cloud hosting in Bangkok. A few have moved significant systems to cloud: e.g., **Webster University Thailand** (an American branch campus) put its systems on AWS cloud and uses the home campus SIS remotely. Data warehouses and BI are emerging – larger institutions have started to deploy BI tools (e.g., **Chiang Mai University** – public but sets a trend – built a data warehouse and uses Tableau for decision support).
- **Operating Model:** Typically, a **central IT department** under the university's administration manages technology across all campuses, often led by a CIO or VP of IT. They enforce common platforms to ensure students and faculty have the same experience whether at main or satellite campus. Given Thailand's strict personal data protection law (PDPA, effective 2022), private universities have become cautious about data handling – many are appointing Data Protection Officers and centralizing student data management. We also see cross-institution collaborations: some private universities share best practices via consortia (e.g., Thai Private University IT Club) to collectively negotiate with vendors and standardize approaches (like edtech standards, security frameworks).

Sources: Stamford U. LMS info ³²; Thai university IT conference proceedings 2024; local news on PDPA readiness in universities.

USA (Large Universities & Private Operators)

The US higher education landscape is diverse, but for **large multi-campus systems and private education operators**, some clear patterns emerge in their technology stacks and data/AI usage:

- **Stacks:** Many large public university systems (e.g., **California State University (CSU)** with 23 campuses, **State University of New York (SUNY)** with 64 campuses) standardized core systems system-wide. **CSU** has a common PeopleSoft **Campus Solutions ERP** (branded CMS) across all campuses for student admin, finance, HR ¹⁵ (this shared ERP is hosted centrally with campus-specific instances). **SUNY** and **CUNY** similarly standardized on systems like Banner or PeopleSoft for all member colleges. Major private universities (single institutions, e.g., **Harvard, Stanford**) often run **Oracle PeopleSoft or SAP** for ERP, and a mix of **homegrown and commercial SIS**. However, a recent trend is migration to cloud-based modern SIS/ERP: e.g., **University of Southern California** and **University of Virginia** moved to **Workday** for finance/HR, and some (like **Arizona State University**) are early adopters of **Workday Student** for SIS. **LMS** in the US has largely consolidated around **Canvas and Blackboard** (Anthology). Over **70% of large universities use Canvas or Blackboard**; Canvas has overtaken Blackboard in many institutions for its ease of use, while Blackboard Ultra and **D2L Brightspace** hold the rest of the market. For example, the entire **University of California system** uses **Canvas** as of mid-2020s (each campus had choice but most converged on Canvas). Private online-focused operators (e.g., **University of Phoenix** under Apollo, **SNHU, Western Governors University**) often develop custom learning platforms but still rely on traditional ERPs for student records (Oracle or Ellucian).
- **Data/BI Practices:** US universities are generally advanced in data analytics for decision-making. Many have enterprise data warehouses (often on cloud platforms like AWS Redshift, Azure Synapse) integrating data from SIS, LMS, CRM, etc. BI tools like **Tableau** and **Power BI** are commonplace in institutional research and executive dashboards. Predictive analytics for student success is a hallmark: e.g., **Georgia State University** famously used predictive models (in partnership with **EAB's Navigate platform**) to improve student retention. Many universities adopt specialized analytics solutions: **Civitas Learning** and **EAB** tools are widespread for analyzing student engagement and risk. **AI use cases** are proliferating: Chatbots (e.g., Georgia State's AI chatbot for freshman onboarding, used to reduce summer melt), AI-driven degree planning (Advising systems that suggest courses), and even early experiments with AI tutors in large online programs. For research universities, AI is also used in operational aspects like scheduling (using ML to optimize class scheduling) and facilities (smart campus IoT analytics).
- **Integration & Identity:** Given the complexity of legacy systems, many US universities invested in integration middleware early. **Enterprise Service Buses (ESBs)** like Oracle Fusion Middleware or IBM WebSphere were common in the 2000s; now, many have shifted to **iPaaS solutions** like **MuleSoft, Boomi, or Azure Integration Services** for more agile API-based integration. Large systems (like University of California) even offer an internal API marketplace for campus developers. Identity management is mature: **SSO via SAML/OIDC** with **Shibboleth or Azure AD/Okta** is standard. Many universities participate in **federated identity** (InCommon Federation) allowing cross-institution authentication for services.

- **Operating Model:** Multi-campus systems in the US often run a **hybrid model** – certain IT services are shared system-wide (especially ERP/SIS infrastructure, network, security), while individual campuses have autonomy in some academic technologies. For example, the **University of Texas System** provides centralized PeopleSoft, but each campus might choose its own LMS. In private for-profit operators (e.g., **Laureate Education** when it was active in the US, or **Kaplan** which partners with universities), a **central IT team** typically manages core platforms to ensure consistency and compliance. Data governance is formal: with FERPA (student privacy law), universities have strict policies and data stewardship roles. Many have **Chief Data Officers** or institutional research directors ensuring data quality and ethical use of analytics.

Sources: Educause Core Data 2025; CSU PeopleSoft CMS documentation; Georgia State case study on predictive analytics; InCommon federation guidelines.

Australia (Large Universities & Networks)

Australian universities are typically single institutions with multiple campuses (city and regional), and a few private operators (like groups owning multiple institutions) exist. Common themes: an early adoption of unified ERP/SIS and recent cloud migrations, plus strong focus on student experience:

- **Stacks:** Historically, **PeopleSoft Campus Solutions** was very prevalent in Australia's universities (especially the Group of Eight research universities). For instance, **University of Melbourne** and **University of Sydney** had PeopleSoft SIS/HR for decades. Recently, many Aussie unis have switched to a domestic cloud ERP: **TechnologyOne OneEducation (Student Management)** – a SaaS student ERP solution. Universities like **Melbourne, UTS, Curtin, QUT, La Trobe** have all implemented TechOne Student Management in the last 5-6 years ³³ ³⁴. This indicates a national trend towards a **unified cloud SIS/ERP** platform (TechOne) ³³, replacing older on-prem systems. Some others are evaluating **Workday Student** but TechOne (an Australian vendor) addresses local requirements well. **LMS:** Australia saw an early move from Blackboard to other solutions; **Moodle** was heavily used (often branded as campus-specific names, e.g., “Wattle” at ANU). Lately, **Canvas** has gained ground: e.g., **University of Melbourne** adopted Canvas around 2016, **RMIT** moved to Canvas in 2018 (and extended it to Vietnam), **University of Queensland** and others also use either Blackboard Ultra or Canvas. Overall, Blackboard's market share declined in Australia in favor of Canvas and Moodle. **CRM:** Universities with big international student recruitment arms (which is most in Australia) use CRMs like **Salesforce** or **MS Dynamics** for managing prospective students and alumni; e.g., **Monash University** uses Salesforce for its marketing and admissions pipeline (per job postings), and **University of New South Wales** uses Dynamics 365 for alumni relations.
- **Data/AI Practices:** Australian universities have been investing in data warehouses and analytics, partly driven by competitive performance metrics and government reporting. Many use solutions like **SAP BusinessObjects** or **IBM Cognos** historically; now moving to **Tableau** and **Power BI** for interactive dashboards. For example, **University of Sydney** built a “Insights” platform on Tableau for department KPIs. AI use is growing: common use cases include **learning analytics** (several participated in the Open Learning Initiative and have learning analytics teams), and **chatbots** for student inquiries (e.g., **Deakin University** deployed IBM Watson-based chatbot “Genie” to assist students). **Predictive analytics** for student retention and academic success are in pilot or early use at many institutions, often leveraging existing data warehouses. Additionally, with Australia's

research focus, some unis incorporate AI in campus operations (e.g., image recognition for campus security at some universities, or AI scheduling tools for timetabling).

- **Integration & Identity:** Australian institutions typically use **enterprise integration platforms** – many with **Oracle SOA Suite or Microsoft BizTalk historically**, now adopting modern iPaaS. Given many have moved core systems to SaaS (e.g., TechOne's cloud), integration via APIs is vital; universities often use **MuleSoft or Boomi** for connecting cloud and on-prem apps. Identity management: Most are part of the **Australian Access Federation** (similar to InCommon) using SAML/Shibboleth for inter-university services. Internally, **Azure AD** is widely used (especially since many use O365), sometimes in conjunction with legacy AD. Students and staff log into a unified portal via SSO for all services (LMS, email, etc.). Multi-campus universities (like University of Queensland with campuses in Brisbane and Gatton, etc.) use one identity across all.
- **Operating Model:** Australian universities generally have centralized IT for all campuses (since they are one legal entity). There has been a push for **shared services** across the higher-ed sector as well – e.g., some universities share their ERP support or data centers in consortiums to cut cost. Private education groups akin to NHG are fewer, but one example is **Navitas**, a private pathway college operator with presence in multiple universities – Navitas centrally manages its student management platform across sites. Data governance is quite rigorous, influenced by laws and the fact that many universities are public institutions – e.g., University of Melbourne has a Chief Data Officer and data governance board overseeing any cross-campus data initiative. The focus is on student experience: many have roles like “PVC (Student Experience)” which drives unified digital services (mobile apps, one-stop student portal).

Sources: TechOne customers (Melbourne, UTS, etc.) ³³ ; Canvas adoption reports (Campus Morning Mail 2024); Deakin Genie AI chatbot case; Monash and UNSW IT strategy documents.

Cross-Country Insights: Despite regional differences, common patterns emerge: **Unified core systems** are critical for multi-entity operations – whether through adopting a single ERP/SIS for all campuses (Malaysia's Taylor's, U.S. state systems, Aussie unis with TechOne) or through strong integration of diverse systems (Indonesia's BINUS with custom platform). **LMS convergence** (to a top 2-3 platforms) is seen everywhere for scale and content sharing. Operating models tend toward **central IT governance with some local flexibility**. Crucially, **data-driven decision-making** is a universal aspiration: advanced institutions invest in data warehouses and analytics tools to drive student success and operational efficiency. AI use cases (chatbots, predictive analytics) are increasingly common pilot projects across countries, signaling that NHG's universities should anticipate similar trends.

Architecture & Operating Model Inference for Multi-Campus University Tech

Drawing from the above research, we infer best practices and patterns relevant to NHG's multi-entity university context:

- **Stack Patterns for Multi-Campus Shared Services:** The optimal pattern is a **unified core platform** supporting all campuses to provide a seamless student and staff experience. This can be achieved via a single-suite **All-in-One Education ERP** (covering SIS, ERP, CRM in one, e.g., Ellucian or TechOne)

or a tightly integrated **best-of-breed** set (separate SIS, LMS, CRM but all connected). The key is **standardization**: e.g., U.S. state systems using one PeopleSoft for all campuses achieved consistent data and processes. A unified stack simplifies offering group-wide services (TechCo style) and governance. However, some groups opt for a **federated but integrated pattern**: allowing each entity to keep certain apps if already in place, but overlaying an integration and data layer to unify experiences (for instance, some Indonesian networks where each campus had its SIS but a central data warehouse aggregates group insights). For NHG, the **“hub-and-spoke” architecture** is promising – core services (IDM, data, integration, possibly LMS) provided centrally (hub) and campus-specific applications (spokes) plugged into it. This ensures a **unified student portal** across NHG, where a student can access any service (courses, finance, email) regardless of which NHG university they attend, supporting “One NHG” experience. In summary, stack patterns that work best are those that emphasize **common platforms for core functions** (especially SIS/LMS/e-Office) combined with modular flexibility (so each new campus can onboard with minimal disruption).

- **Integration Patterns (iPaaS, ESB, Events):** Modern integration for higher-ed favors **iPaaS (Integration Platform as a Service)** and API-centric designs. Older ESB models (on-premises buses) exist (e.g., many U.S. universities used ESB for years), but contemporary approaches seen in advanced institutions use cloud iPaaS like MuleSoft or Azure Integration to connect SIS, LMS, CRM, finance systems, etc. For NHG’s greenfield TechCo, adopting an iPaaS would enable faster integration of existing disparate systems through APIs and connectors (e.g., connecting Edusoft or UniSoft SIS at campus A with the central data lake, or syncing identity from campuses to central IAM). **Event-driven integration** (using message queues or streaming like Kafka) is not yet common in university admin systems, but is emerging for real-time needs – e.g., pushing an event when a student enrolls to immediately update other systems (some U.S. campuses started using Kafka for LMS clickstream analysis). A pragmatic approach is **hybrid integration**: use an iPaaS for most synchronous API needs (like pulling data for a portal) and an event stream for analytics (like capturing all LMS interactions into a central log for AI analysis). Given NHG’s starting point, implementing a lightweight iPaaS (possibly cloud-based, like Microsoft Azure Integration since O365 is widely used, or Dell Boomi which is popular in education) would quickly improve connectivity.
- **Identity & Access Patterns (SSO/IAM):** **Single Sign-On** is essential for unified experience. Patterns observed: use of a central **Identity Provider** (such as Azure AD or Shibboleth) to authenticate users for all systems. Many multi-campus setups create a single identity directory for all users (e.g., one “NHG.edu” domain for all student/staff accounts across group). NHG should implement a **group-wide IAM** with a single user ID per person across all universities, enabling SSO into SIS, LMS, email, etc. The common pattern is to integrate campus systems via SAML or OAuth to this central IdP. Additionally, **federated identity** may be needed if some campuses maintain their own AD – but ideally, migrate all to one directory. Also, role-based access control is important: group-level admins vs campus-level roles need clear provisioning. The pattern used by large systems is to leverage **Azure AD (if O365)** as both the directory and SSO platform or use **Okta/Ping** in more complex scenarios. Multi-factor authentication is increasingly standard for staff access (for security). In summary, a **central Azure AD + SSO portal** aligns with what peers do (e.g., Sunway uses Azure AD for O365 and ties everything to that login).
- **Data Governance Patterns:** Multi-entity universities require strong data governance to unify and trust data from different sources. Patterns include establishing a **central data governance committee** with representatives from each campus, defining common data definitions (e.g., what

constitutes an “enrolled student”, how GPA is calculated uniformly). Technically, many institutions implement a **unified data warehouse or lakehouse** where data from all campus systems is consolidated under common models. Data governance tools (like data dictionaries, lineage trackers) are used by advanced players (some U.S. universities use solutions like Collibra or Informatica for data cataloging). Another key pattern is compliance with local laws: e.g., ensuring data residency if needed (for NHG/Vietnam, likely ensuring student data stays in Vietnam if using cloud). We see in benchmarks that Australian and Malaysian universities, facing new privacy laws, set up clear policies and often a Data Protection Officer role. NHG should similarly implement a **group data policy**, addressing who owns data (likely the TechCo on behalf of campuses), how data can be shared, and security standards. **Master data management** is also crucial: a single student ID across the group, a master list of programs, etc., maintained centrally to avoid inconsistencies.

- **AI Use Cases in Higher Ed:** The most widely adopted AI/ML use cases include: **Admissions & Enrollment** (predictive modeling to forecast applicant yield and identify which admitted students are likely to enroll; chatbots to answer applicant questions 24/7), **Student Retention** (AI to predict at-risk students based on attendance, grades, LMS activity – e.g., systems like Civitas analyze data to flag students who need intervention), **Learning Analytics** (using AI to personalize learning paths, e.g., recommending content or detecting when a student is struggling in an online course; some use adaptive learning platforms in math/intro courses), **Student Services** (chatbots for answering common queries about financial aid, class schedules – many universities deployed AI virtual assistants to reduce call center loads, especially during COVID), **Academic Advising** (AI-driven degree planners that suggest optimal course schedules to graduate on time), **Administrative Operations** (AI for automating back-office tasks like analyzing financial patterns, or HR analytics to predict staffing needs; also, robotic process automation – while not AI per se – is used for repetitive tasks in admissions and finance). In campus operations: **Campus security and facilities** see AI use: e.g., computer vision for monitoring campus safety or energy management systems that use AI to reduce power usage. **Research administration** might use AI to match faculty to grants. Platforms enabling these use cases vary:

- For predictive analytics, universities often use **existing data platforms** (Python/R in their data science teams) or vendor solutions like **Civitas Learning**, **EAB Navigate** for student success.
- For chatbots, common platforms are **IBM Watson Assistant**, **Microsoft Bot Framework**, **Google Dialogflow**, or specialized vendors (e.g., Ivy.ai, Ada). Georgia State’s famous chatbot was built with **Admithub (now Mainstay)** platform.
- Learning analytics might come via the LMS (Canvas has analytics dashboards; Blackboard has “Predict” analytics module) or an external tool integrated via LTI.
- In admissions, CRM systems (Salesforce) increasingly embed AI (Salesforce Einstein) to score leads.
- RPA tools (UiPath, Automation Anywhere) are used for AI-lite automation in processes like transcript processing. For NHG, starting with a few high-impact AI use cases is prudent – e.g., an **AI chatbot for student inquiries** (which could integrate with SIS to answer “what’s my schedule” etc.), and a **predictive retention model** once data is consolidated (to help advisors prioritize outreach). The key enabling platform will be the **group data warehouse/lakehouse** (for predictive modeling) and possibly a **chatbot platform connected via APIs** to core systems. Importantly, a governance around AI (ethics, data quality) is needed as seen in Western institutions.

These inferred patterns underscore that **technology alone isn’t the silver bullet** – a supporting operating model with clear governance, shared services, and phased implementation is needed, which we address next.

NHG Target Architecture Options (3 Scenarios)

NHG can pursue one of three strategic architecture approaches for its TechCo and university group IT transformation. Each option is outlined with a high-level textual “diagram” of components, plus pros, cons, risks, and effort estimates:

Option 1: Standardize-First – Unified Core Systems Across All Universities

Architecture: “*Single Suite & Shared Core*” – Immediately implement a **common core application suite** for all NHG universities. This means selecting a unified **Campus ERP** that includes modules for SIS, Finance, HR, CRM if possible, plus a group-wide **e-Office platform**. The architecture diagram (textually): All NHG entities → feed into one **Integrated Cloud ERP/SIS** (e.g., Ellucian, Oracle or TechOne) which serves as the system of record for students, academics, finance and HR, surrounded by shared **LMS** (one LMS for all, e.g., Moodle cloud or Canvas) and a unified **portal**. A single central **database** holds multi-tenant data (segmented by institution). All users authenticate via one **SSO/IAM system**. Data warehouse and AI tools plug directly into this single source of truth.

- **Pros:** Establishes a *single source of truth* and consistent processes across NHG from day one. Simplifies integration (fewer systems to connect). Enhances student experience – a student or staff transferring between NHG institutions stays on the same system interface. Economies of scale in licensing and support; easier to implement group-wide analytics (all data in one schema). E-Office consolidation (e.g., moving everyone to Office 365 or Google Workspace uniformly) boosts collaboration. This approach aligns with success cases like CSU's single PeopleSoft or Malaysia's Taylor's unified platform – driving governance and efficiency.
- **Cons:** *High upfront cost and change management challenge.* Replacing many systems at once is disruptive – campuses will face steep learning curves and process changes in admissions, enrollment, finance, etc. Implementation timeline can be long (a big bang ERP project). Risk of short-term productivity loss as staff adapt. Also, one-size-fits-all may not fit unique needs of some specialized institutions (loss of some local functionality from old systems). Vendor lock-in risk if one suite is chosen.
- **Risks:** Major risks include **implementation failure** (if timeline or scope is too ambitious – higher-ed ERP projects can fail if rushed), **user resistance** (faculty/staff pushback could derail adoption), and **budget overrun** (such projects can be very costly). Mitigation: use phased module rollout (e.g., student records first, finance next), strong change management (training, champions at each campus), and possibly a pilot at one institution before group-wide rollout. There's also data migration risk – moving historical data from disparate systems into one; mitigation is to migrate essential data only and archive the rest.
- **Dependencies:** Requires strong executive mandate from NHG leadership – all institutions must agree to cooperate. Must have funding for the enterprise software and a capable implementation partner. Also depends on reliable infrastructure (likely cloud hosting for scalability – ensure internet connectivity at all campuses).
- **Effort (36-month horizon): High** – This is a heavy lift. Expect ~12–18 months for selection and initial implementation (perhaps pilot at one uni), then another 12–24 months to roll out to all entities. A project team (with vendor and integrator support) of significant size is needed. By 36 months, core systems could be live group-wide if managed well, but other innovative projects might be slowed due to focus on core.

Option 2: Data-First – Integrate & Analyze (Lakehouse) Before Replacing Apps

Architecture: “*Federated Systems with Central Data & Integration Spine*” – Keep existing campus-specific applications for now, and build a **central data integration layer** as the backbone. The diagram: Diverse campus systems (multiple SIS’s like Edusoft at A, UniSoft at B, etc.) → flow into a **Central Integration Hub (iPaaS/ESB)** → which feeds a **Cloud Data Lakehouse** (e.g., on Azure/AWS) for unified data storage. On top of the lakehouse, implement **BI tools and an AI platform** for analytics. Surround this core with an **integration middleware** that also provides a unified **API gateway/Portal** to front-end systems (e.g., create a lightweight student portal that pulls info via APIs from each campus SIS). In essence, leave the campuses’ operational systems in place initially, but **knit them together** via a data layer and provide group-level digital services on top. Also, implement minimal **digital workplace standardization** (e.g., unify on one e-Office platform like O365 to facilitate collaboration).

- **Pros:** *Lower disruption upfront.* Campuses can continue using familiar systems for now (reducing change resistance). Quick wins in **business intelligence** – the group can start seeing consolidated reports (enrollment, finance) within the first year by populating the data warehouse ⁴. The integration layer also enables introducing new digital services incrementally (for instance, a group mobile app that via APIs shows a student their courses even if the SIS differs by campus). This option builds the *foundational infrastructure* (data and integration) that will be needed regardless of which apps are in place. It aligns with a “think data first” principle: once data is unified, future system replacements are easier since you’ve untangled data from the old silos. Cost can be lower initially – focusing on middleware and cloud data, which are cheaper than a full ERP. Also, early delivery of analytics value can build momentum (e.g., identifying quick improvements in student success from data insights).
- **Cons:** Leaves *legacy inefficiencies* in place longer – campuses will still suffer from their siloed processes (e.g., paper-based workflows in old SIS) until later. The “single student experience” is not fully achieved just by data integration; without unifying core systems, students may still have to log into separate systems for different purposes (though a new portal could mask that somewhat). There’s complexity in maintaining many integrations – effectively you are building a custom middleware to glue together perhaps 5+ SIS/ERP instances, which can be fragile if underlying systems change. Data consistency issues might persist (if each campus defines data differently, the data warehouse could have to reconcile these). In short, it can be complex to manage **federation** at scale.
- **Risks:** **Integration project risks** – building a data warehouse and integration platform without clear scope can become an endless IT project. Mitigate by focusing on high-value data domains first (e.g., student enrollment, finance). **Data quality risk:** garbage in from legacy will be garbage out in reports; mitigation is to implement a data governance team from day one to clean and standardize data definitions. **Security risk:** pulling data from many systems to a central lake increases exposure if not properly secured (must implement strong access controls and encryption). Also, **user adoption risk** for new BI tools – need to train staff to use the dashboards.
- **Dependencies:** Need cooperation from each campus IT team to open up their systems for data access (APIs or database connections). Requires cloud expertise to set up the lakehouse. Also depends on choosing the right integration tech (e.g., Azure Data Factory + Synapse for data, plus perhaps Azure API Management for integration if staying in Microsoft ecosystem given O365 usage). Success depends on a solid central data architecture and skilled data engineers.
- **Effort: Moderate,** spread gradually – 0–12 months to implement integration platform and initial data lake with key datasets, 12–24 months to expand data coverage and build group dashboards, 24–36 to introduce advanced AI and possibly begin replacing legacy apps informed by data insights.

Team size can start small (data integration team), but eventually you'll run parallel efforts to modernize apps in later phases. By 36 months, you would have a robust data/AI platform and perhaps pilot new SIS at one campus, but not full app standardization yet.

Option 3: Platform-First – Build a Flexible “Digital Platform” and Modular Apps

Architecture: “Composable Platform & Identity Hub” – Focus on creating a **central digital platform** that includes: a group-wide **Identity and Access Management system**, an **API gateway** for all services, and common “platform services” like messaging/notifications, document management, etc. Surround this with a set of **modular, composable applications** – possibly leveraging low-code or cloud-native apps – that can be rolled out gradually. Diagram: At the core, **NHG Platform (Integration + IAM + Data)** – this connects to both legacy systems and new microservices. On top, build **Unified Front-Ends**: e.g., an NHG super-portal and mobile app that authenticates via central IAM and then pulls data from either legacy or new microservices. Replace systems piece by piece: for example, start with a new **Student Portal module** (custom or product) that sits on the platform, then a new **Admissions CRM module** next, then gradually swap out SIS components (like course registration service) with new cloud services that talk to the data platform. Essentially, the platform mediates all interactions – old systems become back-end databases over time while new front-end experiences are built on the platform.

- **Pros:** *Maximum flexibility and future-proofing.* This approach avoids heavy upfront purchase of a monolithic ERP and instead lets NHG mix and match solutions – potentially using modern **edtech components** (for instance, one could implement an open-source SIS component or a cloud CRM and integrate via the platform). It can lead to **innovative, custom-tailored user experiences** – e.g., a slick mobile app that aggregates functions, which is easier to develop once a platform and SSO are in place. It also allows **incremental modernization**: you don't have to rip and replace everything – you can progressively introduce new microservices. For example, launch a new online admissions application that feeds into legacy SIS via the platform's APIs (thus improving one area without touching everything). Many top universities effectively move toward this with their “digital campus” initiatives (e.g., some create a student mobile app that layers over legacy systems via APIs). The platform-first strategy would set NHG up not just to catch up but to leapfrog, building an ecosystem where future AI or third-party apps can plug in easily.
- **Cons:** *Complexity in design and strong IT talent needed.* Essentially NHG TechCo would be acting as a system integrator and developer – this is more challenging than buying an off-the-shelf system. Without disciplined architecture, it could become chaotic (lots of microservices but no coherence). The benefits to end-users might take time to materialize; if not done carefully, one could end up with a fancy platform but still reliant on old systems that haven't been replaced (so double complexity). There is a risk of “scope creep” – trying to build too many custom components. Also, a platform approach might still eventually need packaged solutions for big pieces (like an SIS database of record); building a full SIS from scratch is not trivial. Another con is vendor support: packaged ERP vendors won't fully support if you only use bits and integrate with others, so accountability for issues lies more on internal teams.
- **Risks:** **Execution risk** is high – this requires a strong technical team and agile methodology. If NHG lacks experienced enterprise architects or developers, this could falter. **Integration overload:** hooking many systems in real-time could affect performance if not designed well. **Security risk:** a central platform handling all data and auth becomes a high-value target – must be secured by design. **Organizational risk:** stakeholders might not understand this vision easily (it's less tangible than “we install XYZ software”), possibly leading to wavering support; clear communication of the roadmap is needed. Mitigations: start with a proof-of-concept of the platform (maybe build one key

service on it to show quick win), use experienced consultants to design the architecture, and adopt strong API security practices.

- **Dependencies:** A big dependency is **talent** – need skilled solution architects, developers (possibly using cloud services like AWS/Azure for speed). Also need commitment to modern DevOps tools (CI/CD, containerization if appropriate). Choosing a tech stack for the platform is key – could use an enterprise iPaaS with extended capabilities or build on a cloud-native stack (e.g., API Gateway + Kubernetes for microservices + Identity server etc.). Buying some platform components (like identity management system, and maybe an enterprise portal product) would accelerate development.
- **Effort: High initial design effort, then incremental builds** – First 6–12 months would be heavily focused on architecture setup (setting up IAM, integration backbone). Subsequent 12–24 months would see rolling out of initial modules (portal, one or two key apps). Full realization (all major systems modernized or integrated) might extend beyond 36 months given the composable approach. However, tangible deliverables can appear early (e.g., a unified login portal could be delivered in year 1). This option requires an ongoing agile team; by 36 months you could have a robust platform with multiple new services on it, and legacy systems either integrated or partially replaced.

Recommendation: *Option 1* is **bold but risky** (big bang standardization); *Option 2* is **pragmatic** (quick data wins but defers core fixes); *Option 3* is **innovative** (future-proof but complex). We will evaluate these against NHG’s context in the next sections, but generally **Option 2 (Data-first integration)** often provides the best initial value with least resistance, while an ultimate transition to a standardized core (Option 1) or platform approach (Option 3) could follow. Option 3 is ideal if NHG aims to develop strong internal tech capability and unique student experiences; Option 1 suits if a proven vendor solution fits and change can be managed; Option 2 is a safer first phase that keeps future paths open.

(Scores on criteria: see evaluation matrix in Recommendation section.)

NHG 36-Month Roadmap (Phased Transformation Plan)

To achieve the chosen strategy, we outline a phased roadmap over 36 months, divided into **Phase 1 (0–12 months: foundation & quick wins)**, **Phase 2 (12–24 months: expansion & integration)**, and **Phase 3 (24–36 months: optimization & innovation)**. Key workstreams are identified with major activities in each phase:

- **Core Applications (SIS/ERP/CRM):**
 - *0–12 mo:* Conduct group-wide requirements and inventory. Quick win: implement a **group e-Admissions portal** (even if interim) to handle online applications centrally for next intake – reducing paper (could be a simple CRM or web form feeding campuses). Initiate **tender/RFP for unified SIS/ERP** if Option 1 is chosen, or pilot one campus on new SIS if Option 2/3 eventually requires it (pilot likely small unit). Alternatively, if data-first, focus on stabilizing current campus systems (apply patches, ensure Edusoft/others are running latest versions to ease integration). Also, consolidate **e-Office platforms**: decide Google vs Office 365 for all and migrate everyone to one (likely O365 given many are there; quick win: unify email domains under “@nhg.edu.vn”).
 - *12–24 mo:* Implement core app changes: If going Option 1, this phase is where **new SIS/ERP goes live at first universities** (e.g., deploy at 2 pilot institutions by end of Phase 2). If Option 2 (data-first), by now consider **modular upgrades** – e.g., introduce a **cloud-based Finance system** for the group (since finance is more uniform than academic processes) – this replaces disparate accounting

software with one group finance solution (like deploying a Microsoft Dynamics 365 Finance for all). Also deploy a **group CRM** for student recruitment and alumni (choose a CRM and implement across marketing teams). If Option 3, launch initial **microservices** (for example, a new Course Catalog service and a unified student mobile app pulling data via APIs from old systems). In all cases, by 24 mo we aim for at least some **core functions unified** (admissions and finance are likely candidates) and others in progress.

- *24–36 mo*: Complete roll-out of remaining core systems: e.g., full **Group SIS go-live** across all institutions if standardizing (maybe phased by institution). Decommission legacy systems progressively. For platform approach, by this phase most critical modules (registration, grading, HR, etc.) should be available on the new platform, allowing legacy to be sunset. Essentially, Phase 3 achieves a **unified core application environment** for NHG (either via one suite or fully integrated set). Also, fully establish an **NHG Student Portal** that provides one-stop access to all core apps (likely delivered earlier, but by 36 mo it's the primary interface).

• **Digital Workplace (e-Office & Collaboration):**

- *0–12 mo*: Quick win: Pick one collaboration suite (Office 365 vs Google) and **migrate all users** to it. Likely scenario: standardize on Office 365 (given many are using it) – consolidate licensing under NHG, set up a single tenant for all schools for easier management. Implement **group-wide email addresses** and MS Teams/SharePoint for internal communications. Provide training on using e-signature and online approval workflows (if using O365, leverage Power Automate to start digitizing common approval processes, e.g., leave requests, expense approvals – quick win in reducing paper approvals in admin).
- *12–24 mo*: Roll out a **Document Management System (DMS)** for NHG (could be SharePoint or a dedicated e-office software) to digitize all official documents, meeting minutes, etc. Introduce a **unified Intranet** site for NHG where all policies, forms, and news are shared (improving internal transparency). Encourage cross-campus teamwork via Teams/Zoom by hosting inter-campus virtual events, thus embedding the digital culture. Possibly pilot **e-signature solution** for contracts (if compliance allows).
- *24–36 mo*: Achieve a near **paperless office** environment across NHG. All approvals for academic and admin processes should be online (e.g., an academic can submit a new course proposal through a workflow tool instead of email/excel). Evaluate user adoption and refine training. By end of 36 months, NHG staff should consistently use the shared digital workplace tools, enabling easier scaling as the group grows.

• **Integration & Identity:**

- *0–12 mo*: Implement **SSO across existing systems** as a quick win. For example, deploy an identity federation so that a single NHG account can log into each campus's SIS/LMS (even if they are separate) – might involve writing adapters for Edusoft, etc., to accept an NHG central login. Set up the chosen **IAM** (likely Azure AD; if campuses already have AD, establish trust or consolidate). At the same time, start the **integration platform project**: evaluate and choose an iPaaS or ESB solution. Begin with a high-priority integration use case – e.g., sync basic student info from campus SIS to a central NHG database (foundation for data warehouse). This demonstrates the integration in action.
- *12–24 mo*: **Integration layer operational**: Connect major systems through the bus/API gateway. For example, ensure LMS and SIS at each campus are talking to each other via the integration layer

(automate enrollment sync to LMS). Enable data flow for group reporting (SIS → data lake, Finance → data lake). Possibly open some **APIs** for new development (if there's a plan for a mobile app, those APIs would be ready). Identity: by now, have **role-based access** established (so group leadership can see data from all campuses, campus staff see only theirs, etc., managed through IAM). If some campuses still on separate directory, finish migration to one directory.

- **24–36 mo: Advanced integration:** implement event-driven patterns – e.g., when a student status changes in SIS, automatically trigger notifications (perhaps integrated with a messaging app or an advisor dashboard). Introduce an **API marketplace/portal** for NHG – so that in the future, third-party edtech tools or partner institutions could integrate easily (for example, if NHG wants to plug in an online library system or internship platform, they use published APIs). Identity: implement MFA for sensitive systems, and possibly extend SSO to student-facing third-party services (like library systems, etc.). Essentially by 36 months, integration and IAM should be “invisible plumbing” – everything is seamlessly connected and users log in once to access all authorized resources.

- **Data Platform & BI:**

- **0–12 mo:** Stand up a **basic data warehouse** (or data lakehouse) environment in the cloud. Priority one: consolidate **enrollment and financial data** from all campuses to produce an **NHG Executive Dashboard** (quick win: for the first time, NHG board can see total student count, admissions funnel, revenue across all universities in one view). Use a tool like Power BI (leveraging existing O365) to create these dashboards ⁴. Also, define key metrics and common definitions (data governance kickoff – e.g., ensure each campus feeds data using the same definitions for “active student”, etc.).
- **12–24 mo:** Expand data platform to cover **academic outcomes and operations**: bring in LMS data (attendance, grades), HR data, etc., into the lake. Implement more complex BI analytics: e.g., **student performance dashboards** by course, cross-campus comparisons, accreditation KPIs. Possibly deploy a **self-service BI tool** for campus analysts to query the central data (with proper access controls). Begin predictive modeling projects – e.g., develop a prototype **retention risk model** using historical student data (could start with one university's data as a model). Also, implement **data governance processes** – data quality checks, regular data refresh schedules, and a Data Steward group meeting monthly.
- **24–36 mo:** Operationalize **AI/ML use cases** on the data platform. For example, the retention model goes live: advisors receive risk alerts generated from the model each term. Develop an **AI-driven enrollment forecast** for admissions (to predict how many applicants will convert, guiding marketing spend). Possibly deploy a **chatbot connected to the data** – by this time, with centralized data, a student chatbot could answer “What’s my tuition balance?” or “Am I missing any credits to graduate?” by querying the data platform. Also, by 36 months, institutionalize data-driven decision culture: monthly group performance reports, data training for campus leaders to use BI tools. Quick wins become continuous improvement – e.g., one insight might be “Campus X has higher dropout in Year 1 – launch a targeted coaching program and track improvement via the dashboard”.

- **AI Platform & Priority Use Cases:**

- **0–12 mo:** Focus on foundational steps: ensure data is being collected and accessible (the previous workstreams set this up). Identify 1–2 **quick-win AI use cases** – a common one could be a **FAQ chatbot** for answering student questions (which can be built relatively quickly with existing Q&A knowledge base). Perhaps pilot this chatbot on one campus's website by month 12 (covering

common queries about admissions or enrollment). Also, conduct training or workshops to build AI awareness among staff (e.g., what AI can/can't do, to manage expectations and spur ideas).

- **12–24 mo:** Develop the **predictive analytics pilots**: retention model as mentioned, or an **AI-enhanced advising system** that suggests courses. Another use case to implement here: **Automated document processing** – use AI OCR to read student application documents or automate transcript evaluation (reducing manual work). If RPA is considered part of AI efforts: deploy a couple of RPA bots for tasks like data entry between old systems (to alleviate pain while integration fully in place). By the end of this phase, have at least one AI use case producing results (e.g., the chatbot has handled 5,000 queries with X% success, or the pilot retention model identified 50 high-risk students and interventions were done).
- **24–36 mo:** Scale and expand AI: If the chatbot pilot succeeded, roll out a **group-wide AI assistant** (maybe integrated into the student mobile app or portal) covering all campuses and more topics (IT helpdesk, library queries, etc.). Enhance the predictive models using the now larger data pool – for example, a more advanced machine learning model for academic success that factors in LMS data (some universities use neural network models on clickstream to predict grades). Also consider **AI for personalized learning** – perhaps integrate an adaptive learning plugin in the LMS for certain courses (maybe via a product like Cerego or Knewton that uses AI to personalize quizzes). On operations side, use AI in **financial forecasting** or **maintenance** (if sensors in campus, etc., though that might be beyond 36 months). By the end of 36 months, aim for AI to be delivering clear value: e.g., increased retention by a few percentage points due in part to AI early alerts, reduced admin workload via chatbots (measured by fewer phone inquiries), etc. Set the stage for further AI innovation post-36 months (e.g., exploring new tech like learning analytics at scale, or AI-assisted grading, with proper governance).

- **Security & Resilience:**

- **0–12 mo:** Since a lot of changes are happening, immediate step is to establish **baseline IT security**: group-wide security policies, ensure all systems have basic protections (firewalls, backups). Quick win: implement group **cloud backup** for critical systems (maybe backing up on-prem databases to a secure cloud storage, to introduce resilience). Also begin consolidating cybersecurity efforts under TechCo – e.g., one SOC (security operations) watching all campuses. Conduct a vulnerability assessment on critical apps (especially if old SIS have known issues).
- **12–24 mo:** With integration and new systems coming, enforce **security by design**: threat modeling for the new data platform, IAM hardened (MFA rollout to all staff and eventually students, especially for sensitive data access). Possibly introduce a **SIEM (Security Information & Event Management)** system to monitor logs across the group for unusual activity, which is important as more systems go online. Set up a **Disaster Recovery plan** for core systems – e.g., if moving to cloud, use cloud DR, if on-prem, set up a DR site or at least regular drills. Aim to meet at least local standards (for example, compliance with Vietnam's ISMS for education if any, or international ISO27001 eventually).
- **24–36 mo:** Achieve a high level of resilience: e.g., all core systems now have failover (if main data center fails, critical services switch to backup in cloud or another campus). Possibly attain a certification (if relevant) to build trust (some universities get ISO security certifications). Security awareness training for staff and students continuous (to mitigate phishing as more services go digital). Introduce more advanced measures as needed, like **DLP (data loss prevention)** especially if handling a lot of student PII in cloud, and regular **penetration testing** for new applications (portal,

APIs). Essentially by 36 months, NHG's IT should be not only modern but secure and reliable, which is crucial for stakeholder confidence.

- **Change Management & Capability Building:**

- *0–12 mo:* Right from the start, launch a **change management program** – assign a change lead. Quick win: communicate the vision (“One NHG Digital University” concept) to all campuses to build buy-in. Conduct stakeholder analysis: identify champions in each university (tech-savvy faculty or administrators) who will advocate for the changes. Provide basic training sessions on any new tools introduced in Phase 1 (e.g., how to use the new Office 365 email, or the new admissions portal). Also, possibly initiate a **digital skills survey** to baseline staff capabilities and target training. Importantly, ensure leadership frequently communicates quick-win successes (celebrate the first combined NHG dashboard, etc., to show value).
- *12–24 mo:* As more systems roll out, intensify training: e.g., if a new SIS or CRM is being introduced at some campuses, run comprehensive workshops and offer e-learning modules for users. Set up a **peer support network** – super-users at each campus that colleagues can turn to (for example, the registrar at Campus A who mastered the new system can help train others). Possibly establish a **Center of Excellence (CoE)** in TechCo for analytics or process improvement, which includes representatives from campuses, thereby involving them in the transformation. Manage change by phases: before a new system go-live, do roadshows on that campus, get input, configure to address their pain points (to increase adoption).
- *24–36 mo:* Focus on **institutionalizing the changes**. By now, new processes are in place; ensure that updated *Standard Operating Procedures (SOPs)* and documentation are available for everything (e.g., how to do X in the new system vs old way). Gather feedback and continuously improve – maybe adopt a “digital ambassadors” program for students too (students help other students use new portal/app effectively). Build internal capability: identify staff who can be upskilled to take on system admin roles for the new platforms (reduce reliance on external vendors). Also, work on a cultural shift – encourage data-driven decision making through workshops for managers on using dashboards, etc. The goal is that by 36 months, NHG not only has new tech but the people and processes to utilize it fully: a workforce that is more digitally literate and a TechCo team that can sustain and innovate further. Quick win at end: perhaps organize an **NHG Digital Summit** where each campus shares their digital improvements and success stories – solidifying group identity and knowledge sharing.

Quick Wins vs. Big Bets: Throughout this roadmap, *quick wins* in the first 6–12 months (like unified email, first dashboards, simple chatbot) are crucial to build momentum and demonstrate value. These can be achieved with relatively low effort and help secure buy-in for the *big bets*. The *big bets* are the larger undertakings with transformative impact by 24–36 months: e.g., full SIS replacement, data lakehouse, AI-driven retention program – these require significant investment and change but yield high long-term returns. The roadmap phases above ensure quick wins are front-loaded (to show progress), while laying groundwork (in integration, data, training) for the big bets in later phases. Each phase should end with a tangible milestone: end of Phase 1 – “foundation in place and early benefits (dashboards, common email)” ; Phase 2 – “shared services live (some core systems unified, integration flowing)” ; Phase 3 – “NHG operating as one digital university with advanced capabilities”.

Practical Recommendations for NHG

Finally, based on the research and analysis, here are practical recommendations on what NHG should invest in and how to proceed:

- **1. Unified Application Suite Direction:** NHG should aim to **standardize its core application suite** across all universities. Evaluate leading higher-ed ERP/SIS solutions that cater to multi-entity use (e.g., Ellucian Banner, Oracle Student Cloud, or regional solutions like Sunway's Blackboard-based approach or TechOne) as well as the feasibility of upgrading existing solutions (like expanding Edusoft group-wide). Key criteria will include multi-campus support, localization for Vietnam (language, MOET compliance), and modularity. While a single suite is ideal, ensure it supports integration (APIs) so it can fit into NHG's ecosystem. **Shortlist vendors** that have local implementation partners (for support) and a track record in the region. An early investment should be made in this evaluation and perhaps a pilot implementation at one institution to vet the choice before group-wide rollout.
- **2. e-Office Consolidation Path:** Immediately consolidate **email & collaboration** onto one platform (Office 365 is recommended given usage evidence). This is low-hanging fruit to reduce fragmentation (some campuses on Google, some on O365 creates inefficiencies). Migrating everyone to a single domain and platform will improve communications and is relatively straightforward. Next, invest in an **enterprise content management** or e-office workflow system: either leverage SharePoint/O365 fully or consider a lightweight DMS for things like electronic approvals and archiving official docs. This will address the current paper/Excel/email approval issue. The cost here is more in training and change management than technology (since O365 or Google can cover most needs with existing licensing).
- **3. Data/Bi/AI Platform Blueprint:** Allocate budget and resources to build a **central Data Lakehouse and BI platform** for NHG. This should be cloud-based for scalability (e.g., Azure if sticking with MS ecosystem, or AWS). Invest in ETL/ELT tools to continuously ingest data from campus systems. Also invest in **BI tool licenses** (Power BI is likely cost-effective given O365, but Tableau could be considered for advanced analytics if needed). On the AI front, plan for at least one **AI platform or service** – for example, adopting a machine learning service (Azure ML Studio or AWS SageMaker) to develop and deploy models like the student retention predictor. If chatbots are a priority, invest in a chatbot development platform (could be part of Azure Bot Service or Google DialogFlow). Ensure that all these are underpinned by strong data governance – consider a small tool or at least a formal data governance committee. The blueprint should detail how data flows, where it is stored, who can access it (security), and how AI models will be integrated into applications (e.g., an AI suggestion appears in advisor's dashboard).
- **4. Integration & Identity as First-Class Investments:** Set aside budget for an **integration platform (iPaaS)** – many options are subscription-based (e.g., Boomi, MuleSoft) which might fit OPEX budgets. Given the group's needs, this is critical to avoid building too many point-to-point links. Also invest in **Identity Management** – possibly upgrading to Azure AD Premium for advanced SSO/MFA features or a similar identity solution. These foundational pieces will enable everything else to work together. Often, these are not as visible as a new SIS, but they are the “plumbing” that prevents future headaches, so allocate resources and skilled staff/consultants here early.

- **5. Sequencing Logic:** The transformation should be sequenced to mitigate risk:
 - **Phase 0 (immediate):** Get quick wins (unify email, launch initial dashboards, simple chatbot) to build confidence.
 - **Phase 1:** Focus on **integration and data** (so that when you implement new apps, they plug into an already integrated environment).
 - **Phase 2:** Tackle **core system replacements or upgrades** once integration groundwork is done – start with the system that gives most value for group standardization (commonly SIS or Finance). Possibly do finance first because it's more straightforward, then SIS which affects many users.
 - **Phase 3:** Introduce **advanced AI and optimization** after you have reliable data from new systems. This way, each step builds on previous: integration makes core system deployment easier (because data migration and interfacing old/new are smoother), and unified core systems make AI more effective (cleaner data, consistent processes). Always pilot changes in a controlled environment (one willing campus or one department) before scaling group-wide – this lowers risk and allows learning.
- **6. Build vs Buy Evaluation:** Use clear **evaluation criteria when selecting any new platform:**
 - *Functional Fit:* Does it meet higher-ed specific needs (e.g., credit-based system, MOET reporting, multi-language)? E.g., a must-have is support for Vietnamese language and local academic regulations.
 - *Multi-Campus Fit:* Can it handle multiple entities with separate data but some shared setup? (e.g., multi-campus deployment in one instance vs multi-instance – which is better for NHG?).
 - *Integration Capability:* Must have open APIs or integration-friendly architecture (given integration is key for NHG).
 - *Total Cost of Ownership (TCO):* Not just license, but implementation and support for 5-10 years. Consider cloud vs on-prem cost implications (cloud may shift cost to subscription but save on infrastructure).
 - *Security & Compliance:* Does it comply with data privacy laws (Vietnam's and any international if relevant)? Does the vendor have strong security practices (since student data is sensitive)?
 - *Implementation Ecosystem:* Are there local partners who can implement and support it? (e.g., if choosing Ellucian, is there a Vietnam partner? If choosing a local product, is the company stable and experienced?).
 - *Scalability & Future Roadmap:* Will this solution grow with NHG (can handle more institutions if NHG acquires more, or new features like online learning integration)? Use these criteria in RFP scorecards (as per the earlier template T6) to ensure a rigorous selection.
- **7. Shared Services Operating Model:** As TechCo is established, design the organization so that certain capabilities are centralized but still responsive to campus needs. For instance, have **shared IT teams** for infrastructure, security, data, and core apps, but also embed or allocate **campus relationship managers** (liaisons) who ensure campus-specific concerns are heard. Invest in **capacity building** for TechCo staff – perhaps partnerships or training with more experienced universities (maybe an MoU with an international university for knowledge exchange on IT). Encourage a culture of service (SLA/OLA driven as mentioned) – publish service catalogs and performance metrics (uptime, ticket response times) to build credibility.

- **8. Change Management & Training Investment:** Don't skimp on the "soft" side – allocate budget for extensive **training, communication, and business process re-engineering**. The best system can fail if users are not comfortable or processes aren't adapted. Possibly invest in hiring a **change manager or firm** specialized in higher-ed transformations. A small but important investment is creating local language user guides, doing roadshows at each campus, and having on-site support during go-lives.
- **9. Regulatory Considerations:** Given data sovereignty concerns in Vietnam, invest in either local cloud infrastructure or hybrid setups that keep sensitive data on Vietnam soil (especially if using international cloud providers, ensure they have a VN data center or get exemptions if needed). Also invest in compliance management – e.g., ensure student consent for data use in analytics (some AI use cases might require informing students). If NHG plans to eventually host data of minors (K-12 in group?), ensure compliance with those regulations too. These might not be direct "purchases" but require possibly legal consulting and slight tech adjustments (encryption, etc.).
- **10. Monitoring & Continuous Improvement:** After initial implementations, invest in tools to **monitor system performance and user satisfaction**. For example, application performance monitoring (APM) software to catch issues, and periodic user surveys. This will help demonstrate value (e.g., "system downtime reduced from 5% to 1% after modernization" or "90% of students use the new mobile app and rate it 4+ out of 5"). Having these metrics can justify the investments and also guide any course-corrections.

In conclusion, NHG should invest in a balanced combination of **technology (integration, data, core systems)** and **people (training, change, governance)**. Starting with integration/data foundations ensures the group's immediate needs for insight and coordination are met, while paving the way for the bigger application overhaul. The recommended approach is to be **incremental yet strategic**: deliver value at each step to keep momentum, but always with the end-state in mind – a unified, data-driven, AI-augmented NHG TechCo powering all member universities.

Evaluation Criteria Summary: When evaluating vendors or approaches, use the following shortlist of criteria (beyond cost) to guide decisions: - *Functional Fit*: Meets academic and administrative requirements specific to multi-campus universities. - *Architecture Fit*: Aligns with NHG's desired architecture (integration-friendly, cloud-ready, modular). - *Vendor Ecosystem*: Availability of local support, references in similar implementations. - *Total Cost & Value*: 5-year TCO vs benefits; scalable cost model as NHG grows. - *Risk Profile*: Security, compliance, and vendor viability risks are acceptably low. - *Strategic Alignment*: Does it enable NHG's vision of unified student experience and data-driven governance? Each major decision (SIS selection, LMS choice, etc.) should be scored against these to ensure it supports NHG's long-term transformation.

Self-Check: Top 10 Uncertainties and Questions for NHG Discovery

Before finalizing the plan, we acknowledge areas of uncertainty and propose questions to validate assumptions with NHG stakeholders:

1. **Current Systems Inventory & Pain Points:** *Uncertainty*: We have partial info on what systems each NHG university uses (e.g., is Hoa Sen still on Edusoft? Does Hong Bang use a different SIS?). *Question*:

Can we conduct a detailed audit of all existing systems, including their pain points and contract statuses? (E.g., “List all major software in use per campus, and what issues are faced with each.”)

2. **Degree of Autonomy vs Central Control:** *Uncertainty:* How independent are the universities willing to be versus taking orders from TechCo? *Question:* What governance model does NHG envision – will universities be required to adopt group systems, or is it more carrot than stick? (This affects how we drive change.)
3. **Budget Constraints and Phasing:** *Uncertainty:* The total budget available over 3 years is not clear – can we afford big ERP implementations? *Question:* What is the approximate budget envelope (CAPEX/OPEX) NHG is allocating for this digital transformation, and are there funding deadlines (e.g., need quick ROI in year 1)?
4. **Regulatory Requirements:** *Uncertainty:* Are there any specific Ministry of Education mandates on systems (e.g., required reports, use of certain national systems)? *Question:* What compliance/reporting needs must any new system fulfill (for MOET or other accreditation)? (Ensure chosen solutions can produce those, e.g., student data reports in required format.)
5. **Cloud Acceptance:** *Uncertainty:* Will NHG be comfortable hosting student data on public cloud, especially if data centers are abroad, given Vietnam’s laws? *Question:* Does NHG have a cloud adoption policy or any restrictions (like “must host in Vietnam”)? (This will guide whether we choose, say, Azure Singapore vs a local VN cloud provider or on-premise.)
6. **Integration with Non-educational Systems:** *Uncertainty:* The scope mentioned ERP, SIS, LMS, etc., but do we need to integrate with external systems (e.g., national student database, or banking systems for tuition, etc.)? *Question:* What external systems or third-party services must we integrate with (e.g., MOET systems, digital payment gateways for fees, library systems)?
7. **HR and Change Capacity at Campuses:** *Uncertainty:* Do campuses have people who can drive change locally (IT staff, trainers)? *Question:* What is the capability of each campus’s IT and admin staff – do we need to bolster teams at some campuses to handle the changes? (This identifies where to focus training or even hire new roles.)
8. **Unique Campus Needs:** *Uncertainty:* Some NHG universities might have unique programs (e.g., medical school needs hospital integration, etc.). *Question:* Are there any unique academic or operational requirements at any campus that could impact system choices (for example, if one campus has a medical college needing a clinic management system integration, or another has a high school attached needing K-12 features)? (We must ensure the chosen approach can accommodate these.)
9. **Timeline Flexibility:** *Uncertainty:* The urgency – is there a hard deadline (like NHG leadership expecting major deliverables by a certain date)? *Question:* Are there specific milestones NHG is targeting (e.g., “by next academic year, have new admissions system”, or “by 2026, one common SIS”)? (This will calibrate how aggressive the roadmap should be.)
10. **Stakeholder Expectations for AI:** *Uncertainty:* The term “AI” can mean different things; maybe leadership expects some “smart campus” flashy outcomes. *Question:* What are the top AI use cases

NHG leaders are most interested in? (e.g., chatbots, predictive analytics, automated teaching assistants?) – This helps prioritize which AI pilot to focus on that will impress stakeholders and add value.

By seeking answers to these questions (through stakeholder meetings, surveys, and further discovery workshops), we can validate assumptions from our research and tailor the implementation plan to NHG's exact context, ensuring the roadmap is realistic, focused on the right objectives, and set up for success.

-
- 1 Phần mềm hệ thống quản lý đào tạo Edusoft.Net – AQTech
<https://aqtech.edu.vn/product/phan-mem-he-thong-quan-ly-dao-cao-edusoft-net/>
 - 2 5 6 7 8 9 10 11 12 17 18 19 20 24 Danh sách Khách hàng – AQTech
<https://aqtech.edu.vn/danh-sach-khach-hang/>
 - 3 SAP và Đại học Bách khoa Hà Nội hợp tác đào tạo nhân tài trẻ cho ...
<https://vietnamnet.vn/sap-va-dai-hoc-bach-khoa-ha-noi-hop-tac-dao-cao-nhan-tai-tre-cho-cong-nghiep-40-i377571.html>
 - 4 Tập huấn nghiệp vụ sử dụng phần mềm Quản lý đào tạo PSC UIS cho cán bộ quản lý đào tạo đại học chính quy của Nhà trường – NEU
<https://neu.edu.vn/tap-huan-nghiep-vu-su-dung-phan-mem-quan-ly-dao-cao-psc-uis-cho-can-bo-quan-ly-dao-cao-dai-hoc-chinh-quy-cua-nha-truong-1/>
 - 13 14 FPT Software cung cấp phần mềm quản lý đại học Eduprove tại Việt Nam | BÁO SÀI GÒN GIẢI PHÓNG
<https://www.sggp.org.vn/fpt-software-cung-cap-phan-mem-quan-ly-dai-hoc-eduprove-tai-viet-nam-post33194.html>
 - 15 16 myRMIT information - RMIT University
<https://www.rmit.edu.vn/students/my-studies/myrmit>
 - 21 23 Phần mềm quản lý đào tạo tín chỉ UniSoft - Thiên An
<https://tinchi.hubt.edu.vn/Login.aspx>
 - 22 Thiên An - Trường Đại Học Lao Động - Xã Hội
<http://test.uls.edu.vn/>
 - 25 Blackboard On Tour comes to Sunway | Sunway College
<https://sunwaycollege.edu.my/news-events/blackboard-on-tour-comes-to-sunway>
 - 26 27 Taylor's ODL: Sign-in Page
<https://canvas.taylors.edu.my/>
 - 28 29 30 31 BINUS UNIVERSITY Presents Innovative and Inclusive Learning System through BINUSMAYA 7.0 - Source Asia
<https://news.microsoft.com/source/asia/2023/07/25/binus-university-presents-innovative-and-inclusive-learning-system-through-binusmaya-7-0/?lang=id>
 - 32 Document
<https://mkp.stamford.edu/>
 - 33 34 List of TechnologyOne Student Management Customers
<https://www.appsruntheworld.com/customers-database/products/view/technologyone-student-management>