

Impact of Corporate Real Estate Strategy on Corporate Sustainability: A Case Study of the Papua New Guinea University of Technology

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Abstract

This paper investigates the challenges and opportunities associated with the pursuit of sustainability goal by corporate institutions through the adoption of a viable corporate real estate strategy. This issue has become a highly topical one in contemporary real property research because corporate real estate accounts for the second or third largest expense of most corporations around the world, after workers' salaries and perquisites, and it is a factor that correlates directly with business success. The paper focuses on the corporate sustainability of tertiary educational institutions, with particular reference to the Papua New Guinea University of Technology, the only University of Technology in the South Pacific region. The central thesis of the paper is that the demonstrated viability of an overdue large-scale, real estate project (a permanent graduation hall) can be used by the university as a pedestal for boosting its corporate profile and achieving sustainability in its coveted position as an urban "magnet" and "enclave" even amidst the current financial uncertainty that has engulfed the institution due mainly to the current downturn in global economy. In addition to survey findings based on a questionnaire survey of 150 respondents conducted in the City of Lae in 2014, which revealed that the proposed project is overwhelmingly supported by the local community, the paper answers three research questions that are then reinforced by a set of viability and sensitivity analyses aimed at exploring whether or not the university should really embark on the project as an investment opportunity in these austere times.

Keywords: *Corporate real estate strategy, magnet, enclave, sustainability, viability, residual valuation, permanent graduation hall, Papua New Guinea University of Technology.*

1. Introduction

It is widely believed that corporate real estate correlates directly with business objectives. Therefore, real estate owned or leased by companies or corporations, including universities, has direct impact on company success and long-term sustainability (www.ceres.org, accessed 08.06.2005), and consequently, its involvement in the overall strategy process is of prime importance. According to KPG (2014), a systematic planning of all real estate-related business activities and a regular adjustment with the corporate strategy ensure a maximum utilisation of

potentials within the operational real estate portfolio. However, an overarching challenge to be met is making cost-effective management decisions that are capable of linking mostly long-term real estate decisions with a corporate strategy that has to flexibly adapt to a rapidly changing academic-research business environment.

In an urban context, universities as large landowners have been described as “magnets” and “enclaves” (Martins and Neto, 2007). First, a university is a “magnet” representing a concept or metaphor which describes a territory in the urban area which attracts people and economic activity towards it, while it is an “enclave” representing a self-contained place or region of the city, with land uses or morphology different from the ones of the surrounding neighborhoods (Martins and Neto, 2007). Consequently, universities may generate a number of impacts on an urban area as well as on the entire country where it is situated. For example, the presence of a university campus within a derelict area may initiate the transformation of the entire neighborhood through the action of the university, as a land developer, regenerating areas around it in order to attract students and professors to live nearby (Perry and Wiewel, 2005). A very good example is the case of the University of East London in the UK that has transformed the old London Dockyards into one of the most beautiful spots in London today. The desire of other developers and land users to locate in close proximity to such a “magnet” results in appreciation of land and real estate values (O’Flaherty, 2005), thus confirming the validity of Alonso’s (1964) rent bid model. University campuses can also be accepted as magnets because they have the power to attract many good students, faculties and staff as well as business opportunities and institutional activities to a specified region of the city. Ultimately, the agglomeration of people makes commerce and services more profitable as there is a greater probability of matching consumers and producers’ interests (Martins and Neto, 2007; DiPasquale and Wheaton, 1996; Martins, 2004). Nevertheless, when acting as a magnet and attracting uses that promote urban and economic growth, a university also attracts activities that may be negative or damaging by particular groups in society, such as when neighbours are left to suffer from traffic congestion, population increase and unaffordable house prices and/or rents.

Second, the concept of a university as an “enclave” in the city context refers to an entity removed far from the immediacy and demands of modern life to produce the knowledge and information with which to better understand society (Inter-American Development Bank, 2004; Martins and Neto, 2007). Such enclaves produce breaks in the urban fabric, which may cause a disconnection between areas located around the university campuses. The resulting dichotomy of acting as magnets and enclaves for urban development is an enduring nature of large universities. According to Martins and Neto (2007), when the analytical interest lies on the impacts of universities as centers of attraction of people and business, the concept of “magnet” is the protagonist. Conversely, when the impact of interest is related to the spatial or morphological structure of universities, the concept of enclaves becomes dominant.

Enclave projects are large, productive oriented public or private sector investment projects that import technologically sophisticated production and/or marketing systems into the local economy, operate with a high degree of autonomy and export the goods produced (Inter-American Development Bank, 2004). According to this development bank, a defining feature of enclave projects is that the direct benefits flow outside the community where they operate, while they can become problematic when they result in present or future losses to the community, some of which may be difficult to fully assess and compensate, and/or unrealised community expectations of increases in wellbeing. However, previous investigations have revealed that

enclave projects are not necessarily negative in and of themselves (US State Department, 2000; United Kingdom Parliament, 1998; Stern, 2001; African Development Bank, 2000; UNDP, 2002; World Bank, 2004; Youker, 2004; IMF, 2003).

It is argued that positive social programs, such as higher education, are investments in the human and social capital of individuals and communities (Inter-American Development Bank, 2004). Hence, there are good reasons to include positive social programs in enclave projects. First, there is ample evidence in the development project literature of negative social and environmental consequences of enclaves, some of which go beyond those that are normally subject to compensation and mitigation (World Commission on Dams, 2000). Second, community complaints in the case of enclave projects, many resulting from faulty consultations processes, can increase project costs and severely disrupt project execution (Donahue and Dixon, 2000). Therefore, lending institutions supporting enclave projects need to put in place safeguard policies and guidelines for controlling environmental and social impacts to mitigate potentially negative direct and indirect environmental and social impacts (Dixon, 1988) of the projects they finance.

The Papua New Guinea University of Technology as a “Magnet” and “Enclave”

The Papua New Guinea University of Technology (PNG Unitech, for short) in Lae, Morobe Province, is the second largest university in Papua New Guinea, after its 'sister' university - the University of Papua New Guinea in Port Moresby - both having been created in 1965 (PNG Unitech, 2009). While the latter concentrates on the arts, pure sciences, law and medicine, the Papua New Guinea University of Technology focuses on teaching and research in technological and applied sciences subjects. PNG Unitech is the only technological university in Papua New Guinea and in the South Pacific Region, and has a growing reputation in teaching and research especially in those fields in which Papua New Guinea and its South Pacific neighbours have a vital interest. The University was originally created under the name of the Papua New Guinea Institute of Higher Technical Education on 26 May 1965, by an Act of the House of Assembly, and was initially located in Port Moresby. In 1968 it moved to a 2-square kilometer campus outside of Lae and in March 1970 was renamed the Papua New Guinea Institute of Technology. The institution achieved its present status in August 1973 when it became a full-fledged university backed up by an Act of the PNG Parliament. It graduated her first four graduates in Surveying in 1970 at Duncanson Hall. Today, the University's graduates are making very positive contributions in every sphere of Papua New Guinean society. In the political arena, some of the graduates are ably performing leadership roles. They include Hon. Don Polye, the Minister for Works, Transport and Civil Aviation, and Hon. Gabriel Kapris, the former Minister for Trade and Industry.

The university has grown from just 37 students in 1967 to over 3,000 in 2015 and it has awarded tens of thousands of undergraduate and post-graduate degrees and diploma certificates to students mainly from Papua New Guinea and the neighbouring Pacific countries. This represents a significant proportion of the Nation's professionally trained working population. The University employs approximately 700 members of academic, technical and administrative staff. It has three affiliated colleges for the training of nurses, teachers and forestry personnel. Its main campus (Figure 1) comprises teaching, research and residential facilities and has an eye-catching landscape built on an approximately 202-hectare (500-acre) site at Taraka, a north-north-eastern suburb of the City of Lae in Morobe Province (Royal Australian Survey Corps/NMB, 1982).

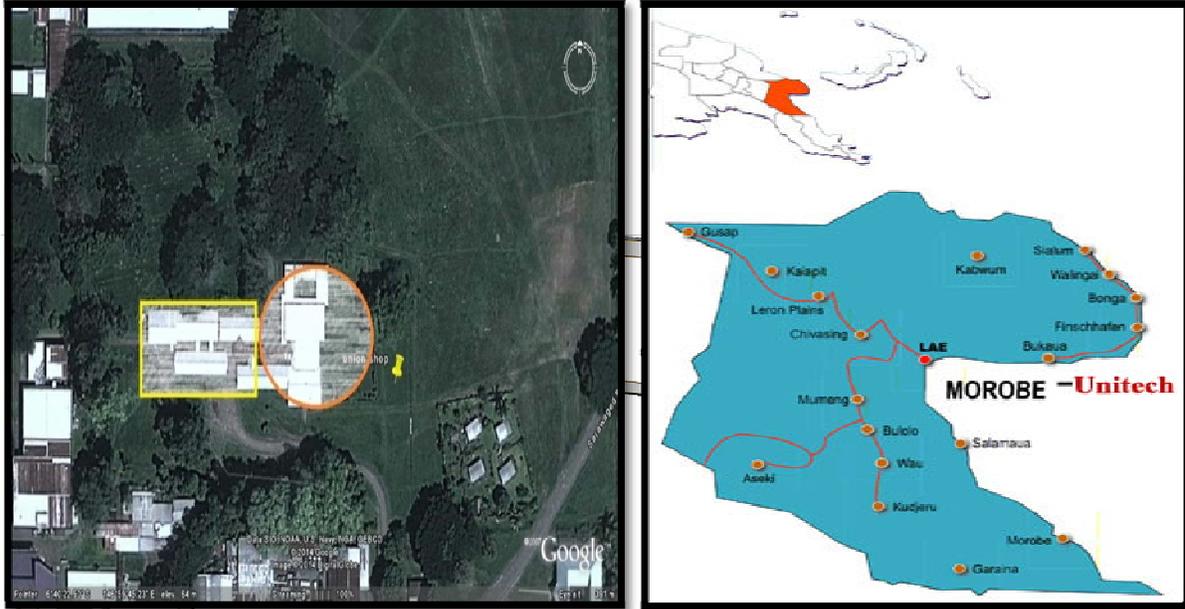


Fig 1. (Left) PNG Unitech's Main Campus, Taraka, Lae, Morobe Province

Fig 2. (Right) The Location of the City of Lae in Papua New Guinea

Source: Google Map, 2014.

Some buildings worth seeing include the Haus Tambaran-style (Spirit House) Coffee-Haus and the 36 Sepik-style Duncanson Hall with carved pillars. Lae is Papua New Guinea's second largest and fastest growing city and seaport (Figure 2). It is an important communications centre and a hub of the Country's airline network as well as a road terminal for the Highlands Provinces, Madang Province and the surrounding areas of Morobe Province. The purpose of this paper is to demonstrate how organisations, like the Papua New Guinea University of Technology, could apply a sustainable real estate strategy in boosting their corporate profile and sustainability. The paper is divided into four sections. After the introduction in the first section, the second section examines the research problem and the contributions of the paper to knowledge through three research questions. The research method is then presented in the third section, while the research findings, discussion and conclusions are presented in the concluding section.

2. Nature of the Problem and Contributions to Knowledge

Currently, all the public universities in Papua New Guinea are facing a financial crisis stemming from a recent decision of the central government to cut their annual budget by about 40 percent in the face of dwindling oil and other revenues traceable to the current global economic downturn (<http://oilprice.com/Energy/Oil-Prices/Current-Oil-Price-Slump-Far-From-Over.html>, 2/11/2015). Consequently, the Papua New Guinea University of Technology has been exploring strategies by which it could cope with the unexpected shortfall in its annual revenue while still facing the challenge of meeting its commitment to providing adequate support services for its traditional teaching, research and community responsibilities. One solution that the authors contend might offer a way of escape from possible worsening financial crisis in the near future is for the University to start investing in viable and sustainable real estate projects inside and outside of its expansive 202-hectare (500-acre) site at the Taraka campus in Lae. To kick-start this complex journey to financial freedom, "Unitech" can start off by considering the planned

implementation of a proposed permanent graduation hall. Since its inception in 1965, the University has conducted its annual graduation ceremonies in a makeshift graduation hall (Figures 3a and 3b). It is contended that this practice is not only too expensive and unhealthy, but also unsustainable for the institution. Concerns regarding the lack of proper graduation facilities and services for both graduates and parents are raised every year by the participants. With the increasing number of graduates, the makeshift hall does not cater for most parents and friends, who, on most occasions, have had to travel in from all over Papua New Guinea to witness their loved ones graduate, only to find out that there was not enough space to cater for every one of them. Consequently, they resign to fate and sit on the lawns surrounding the makeshift hall while the graduation ceremony lasts.



Fig 3. (Left) A Makeshift Graduation Hall in its early construction stage, (Right) A Makeshift Graduation Hall in use at the PNG University Campus.

Source: Authors, 2014

It is also contended that a permanent graduation hall (Figures 4a and 4b), owned by the University, will play several important roles. First, it will provide a larger space for future graduation ceremonies and allow all parents, celebrants and invited visitors to have a seat inside and be properly accommodated. Second, it will add splendor to the occasion by providing better building facilities that enhance the status of the only technological university in South Pacific. Third, it can be used to generate income for the University through the grant of short leases and/or licenses of space at reasonable rents for special events, such as conferences and approved social and business activities organised by community stakeholders in the country thereby promoting better interactions with the local community and enhancing its corporate social responsibility status. At present, the University is unable to harness these benefits, which must have hampered its corporate profile over the years, although further research is required to document the extent of damage.



Fig 4. (Left) External and (Right) Internal architectural impressions of a permanent graduation hall for PNG Unitech.

Source: Department of Architecture & Building, PNG Unitech, 2014.

Therefore, the central thesis of this paper is that a sustainable corporate real estate (CRE) strategy has the capacity to boost and sustain the “magnet” and “enclave” contributions and corporate sustainability of a university, such as the PNG University of Technology. As is the case with enclave projects, community complaints often result from flawed consultation processes that can increase project costs and severely disrupt project execution. Therefore, if the present study that seeks to enlist early public consultation is not carried out now, the university and its stakeholders may continue to witness the problems encountered yearly as a result of hosting annual graduation ceremonies in a makeshift graduation hall, particularly in view of the huge expenses incurred in the process and the budgetary cuts that are increasingly becoming unsustainable for the university. This study is important as currently the university lacks a sustainable real estate strategy, which is capable of adversely affecting its corporate profile and sustainability. The study will also remind all stakeholders concerned that graduation ceremonies are one of those most special moments in the lives of students that are vital and also because presentation ceremonies are the highest profile events in a university’s academic calendar. In addition, as a well-known higher educational institution in the South Pacific Region, it is logical that the Papua New Guinea University of Technology has its own proper hall to enable graduation ceremonies progress smoothly free of any issues as occasionally witnessed in some countries. For example, as reported in an American newspaper - Malker County Messenger: The Catoosa County News, USA, on 23 May, 2014— an over capacity crowd caused problems at a graduation ceremony held in honour of the Ridgeland High School Class of 2014 (http://www.northwestgeorgianews.com/catwalkchatt/news/education/over-capacity-crowd-causes-problems-for-ridgeland-high-school-class/article_0e314708-e290-11e3-93f4-0017a43b2370.html, 20 August, 2014). The paper attempts to answer three research questions as a means of contributing to knowledge, as follows:

- i) Is the current practice of using a makeshift hall for graduation ceremonies at the Papua New Guinea University of Technology sustainable?
- ii) What are some sustainable/viable strategies and financial implications of a proposal to have the University develop a permanent graduation hall?
- iii) What are the likely impacts of a well-planned real estate strategy on both the University community and its corporate profile for speedy attainment of corporate sustainability?

3. Conceptual Framework

The conceptual framework adopted for this paper is the “Sustainable Corporate Real Estate Strategy” (Figures 5a and 5b). According to Krumm (2001), corporate real estate (CRE) strategy is a top management responsibility, and because corporate real estate correlates directly with business objectives and business sustainability and thus has direct impact on company success, its involvement in the overall strategy process is crucial. For most corporations or companies, real estate is their second or third largest expense and a factor that impacts every dimension of their business operation, according to KLG Advisors (2014), a New York-based company that specialises in raising corporate real estate strategy as a key business driver that helps these corporations yield hundreds of millions of dollars in cost savings and value enhancements that deliver extraordinary financial and operational improvements, enhanced productivity, better ongoing real estate decision-making, and enhanced corporate image and identity. A corporation that relies on space, such as the PNG University of Technology, needs to systematically plan all its real estate-related business needs and activities, and regularly adjust them by way of space audit with its corporate strategy so as to ensure optimum utilisation of potentials within its operational real estate portfolio (Figure 5). The particular challenge to be met at this point is to link mostly long-term university’s real estate decisions with a corporate strategy that has to flexibly adapt to a rapidly changing academic-research environment. In addition, the vision, mission and values of a university, such as Unitech’s, depend on the cost-effectiveness and sustainability of its corporate real estate strategy (CRE).

Krumm (2001) further observes that corporate real estate is the real property (real estate assets and the freehold or leasehold interests therein) held or used by a business enterprise or organisation for its own operational purposes. A corporate real estate portfolio typically includes a corporate headquarters and a number of branch offices, and perhaps also various manufacturing and retail sites. Corporate real estate may also describe the functional practice, department, or profession that is concerned with the planning, acquisition, design, construction/fit-up, management, and administration of real property on behalf of a company. Corporate real estate professionals approach the real estate market from the owner-occupant perspective, both leased or the buy-side, primarily demand-perspective, similar to corporate purchasing or procurement. As such, they seek to contain costs, and may benefit from economic environments that are described by most as “weak”. Although closely related to facility management and property management, CRE as a concept is usually broader in corporate functional scope but narrower within the real estate sector. For example, CRE professionals (or departments) typically dedicate greater emphasis and time on multi-site long-range planning (often called “portfolio planning” or “strategic planning”. However, CRE is almost exclusively focused on commercial properties (mostly office, with industrial and retail depending on the company); residential properties are rare in a corporate portfolio.

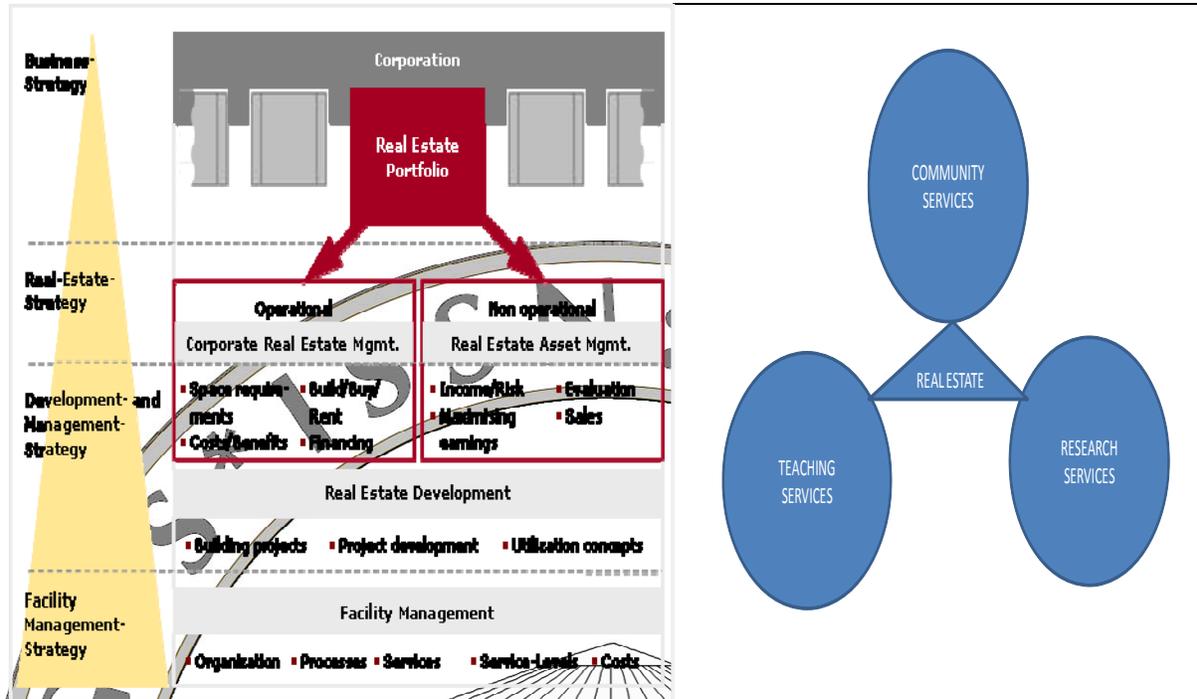


Fig 5. Conceptual Framework (Left - A University's Corporate Real Estate Strategy. Right - Hypothesised Impact of Real Estate on Teaching, Research and Community Services).

Sources: 5a - After Peter J. M. M. Krumm (2001); 5b - Authors 2015

The basis for a strategic and sustainable management of the resource “real estate” can be established through a properly designed and managed database for a corporation's real estate portfolio, together with an explicitly formulated sustainable real estate strategy. Such a strategy needs to be synergized with the relevant institutional sub-systems that operationalise the vision, mission, specific goals, values and objectives of the entire organization (university) for the benefits of all categories of management, staff, and other stakeholders of the corporation as well as the host communities.

4. Method

As a practical application of the conceptual framework, this paper adopts a case-study approach that was subjected to a combination of viability analysis, sensitivity analysis and analysis of the perceptions of 150 respondents out of the 200 individuals selected for a questionnaire survey between September 2014 and July 2015, using stratified sampling technique and indicating a response rate of 70 percent. The timing of the questionnaire survey was intentionally fixed to coincide with three key Unitech events. The events were (i) preparations in 2014 by final year students to sit for their final degree examinations in October before saying goodbye to the University (ii) preparations for enrolment of new undergraduate students in January/February, 2015, and (iii) the actual graduation ceremonies held in April 2015 for the 2014 graduating students followed soon afterwards by the University's 2014 Open Day activities which enabled lots of visitors including prospective new students to visit the University to make enquiries

regarding course offerings in the coming academic year. The sample, made up of 80 males and 70 females, was considered representative of the entire University community and stakeholders as respondents came from all the thirteen academic departments of the University, parents and government officials. The sample also included academic and non-academic staff, existing final year students of the University, parents, friends and graduates who were given a questionnaire each for completion in order to elicit relevant and useful data from them concerning their perceptions about the impacts of both a permanent graduation hall and a makeshift graduation hall at the University's Taraka Campus in Lae. The respondents were of various adult age-groups and socio-economic strata in the society. In order to boost the findings from the structured questionnaire survey, informal interviews, physical site inspections and documentary analysis were used to capture data that would otherwise be impossible to capture in an ordinary questionnaire survey. For example, the authors obtained additional data on the annual expenses incurred by the University in erecting and dismantling a makeshift graduation hall by staffs in both the Estates and Building Services Department and the Bursary Department of the University to undertake a development appraisal (residual valuation).

After using the findings from the questionnaire survey to answer the first and last research questions posited in this paper, the paper attempts to demonstrate the relationship between the concept of sustainable development and corporate real estate strategy by gleaning from and adapting the "sustainability matrix" often used by the World Bank (Dumanski, 1997) in appraising projects comprising, on the one hand, a set of criteria for measuring the economic and financial viability (developmental/growth dimension) of the proposed permanent graduation hall, as well as a set of criteria for measuring the ecological and social sustainability of the project (the environmental/social dimension) on the other hand. The viability analysis was then subjected to a real estate market-aligned sensitivity analysis in order to verify the validity of the project's viability parameters because the perceptions of our survey respondents alone cannot be relied upon as telling the truth about the sustainability of the proposed permanent graduation hall at the PNG University of Technology.

5. Findings and Discussion

Our analysis of data follows the order in which the research questions for the study appears in the second section of this paper. The findings are as follows:

- (i) *Is the current practice of using a makeshift hall for graduation ceremonies at the Papua New Guinea University of Technology sustainable?*

When asked for their perceptions about the idea of the University hosting graduation ceremonies in a makeshift hall, 70% of the respondents indicated that having graduation ceremony in a makeshift hall was not a good policy; 20% of respondents indicated that it was good and 3% indicated that it was very good (Table 1). When asked whether they had experienced any space problems (e.g. for vehicular parking and/or sitting during past graduation ceremonies), the respondents overwhelmingly indicated "Yes" (96.67%) on the questionnaire, while only 3.33% indicated "No". This further confirms the unpopularity of makeshift graduation halls at the Papua New Guinea University of Technology.

Table 1. “How did you see the graduation ceremony in the makeshift hall?”

Perception	No of Respondents	PC of Total
Very good	5	3.33
Good	40	27.00
Not good	105	70.00
Total	150	100.00

Source: Authors, 2015

A breakdown of the respondents showed that most attendees of the graduation ceremony held in 2014 were graduates and students of the University and nearby educational institutions (Table 2). It is contended that many parents and guardians might have decided to stay away from the graduation ceremonies due to past experience with shortage of space and sitting facilities inside the makeshift hall.

Table 2. Socio-economic groupings of attendees at the 2014 graduation ceremonies

Occupation	Frequency	PC of Total
Student	50	33
Lecturer	30	20
Parent	10	7
Administration Staff	15	10
Graduates	45	30
Total	150	100

Source: Authors, 2015

The respondents were then asked to give reasons for their perceptions. More than half of the respondents (66.67%) complained about insufficient seating capacity inside the makeshift hall. About twenty-seven percent (26.67%) indicated that the space inside the hall was too humid, while 16.67% detested the shortage of good parking facilities (curiously, it should be noted that the makeshift hall was erected on a large parking lot that normally serves the daily parking needs of three academic departments of the University), and body discomfort due to heat and poor ventilation (16.67%) throughout the duration of the ceremonies. In fact, almost seven percent (6.67%) of the respondents indicated that the arrangement was dangerous for human health and safety (Figures 6a and 6b).

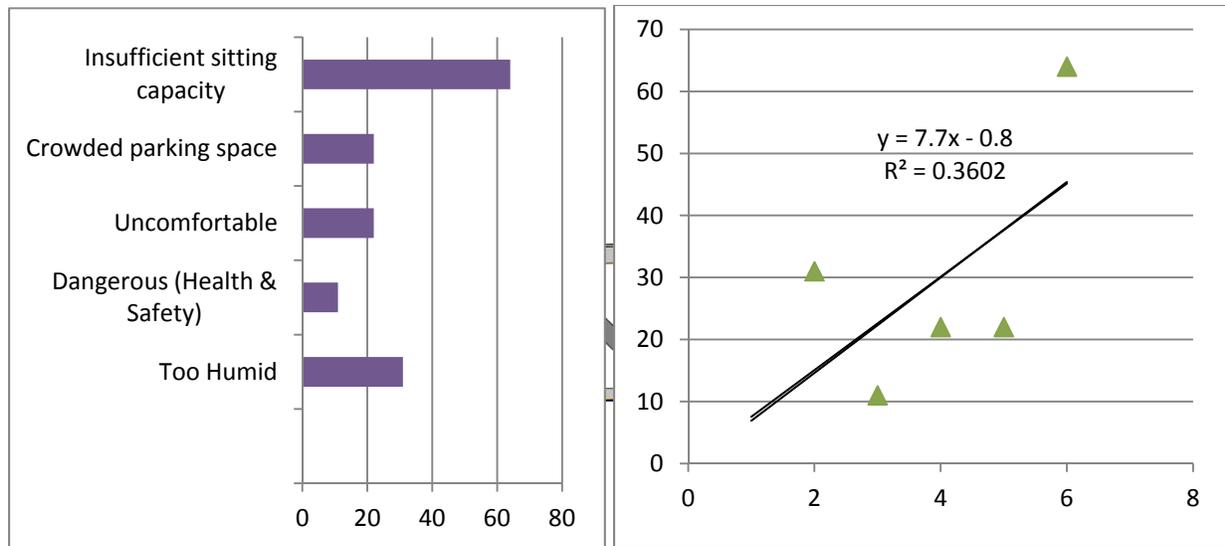


Fig 6. Chart (Left side) and scatter graph (Right side) showing the reasons behind respondents' perceptions.

Source: Authors, 2015

Based on the findings produced by the scatter graph in Figure 6b, some deductions can be made on the linear equation, as follows:

$$y = 7.7x - 0.8 \quad \text{Equation 1}$$

where

- y = level of ecological and social sustainability
- 7.7 = intercept value
- b = - 0.8
- x = explanatory variables of ecological and social sustainability
- R² = coefficient of linear determination = 0.3602
- Correlation, r = Square Root of R² = 0.60

First, the positive relationship between the “x” and “y” variables shows that as the values of “x” increase, the values of “y” also increase and vice-versa. This implies that as the venue of the makeshift hall becomes increasingly unhealthy (e.g. with shortage of sitting spaces, crowded parking spaces, discomfort, danger and high humidity), the level of sustainability of the hall worsens and vice-versa. However, in view of the low level of the R² value, the authors felt that a complementary financial analysis would be necessary to highlight the contributions of economic/financial variables in explaining “sustainability.” This is why we have undertaken a viability analysis in Table 5 and a sensitivity analysis in Table 6.

Meanwhile, when further asked to assess the overall quality of organisation of the graduation ceremonies, 36.67% of the respondents indicated that most parents and guardians could not make it into the makeshift hall. This is particularly worrisome as parents and guardians should normally be given priority amongst invitees to witness the graduation ceremony of their sons and daughters. About thirty-three percent (33.33%) of the respondents indicated that the graduation ceremonies were usually well organised inside but not outside, while 26.67% indicated that the ceremonies were not well organised. The remaining 3.33% of the respondents, however,

indicated that the graduation ceremonies were reasonable and acceptable. One respondent curiously suggested: “If the makeshift hall is still going to be used, the University should provide telecasts to Duncanson Hall (Figure 7) and Rose Kekedo Lecture Theatre to address sitting audiences of our parents, guests, and friends.”



Fig 7. The Duncanson Hall at Unitech’s Taraka Campus, which currently serves as a Multi-purpose Hall, excluding graduation ceremonies.

Source: Ginton, N. (2014)

Economic/financial viability analysis

We collected data on the expenses incurred on makeshift halls within the last three decades for which data was available (between 1980 and 2014) and then made reasonable projections till Year 2024, by which time we believe a permanent graduation hall ought to have been constructed by the University, *ceteris paribus*.

Table 3. Estimated Expenses Incurred onMakeshift Graduation HallsBetween 1980 and 2014

	Five (5) Yearly Periods	Estimated Costs (Kina)
1980’s	1980 – 1984	39, 915
	1985 – 1989	38, 794
1990’s	1990 – 1994	43, 105
	1990 – 1999	47, 895
	2000 – 2004	53, 217
	2005 – 2009	59, 130
	2010 – 2013	65, 700
Total(Past 33 Years)		347, 756
Current	2014	73, 000
Projected Cost for the next 10 years	2015 – 2019	80, 300
	2020 – 2024	88, 330
Total (Projected)		168, 630*
Grand Total (1980 -2024)		K589,386

**Expenses are assumed to increase by 10% every 5 years.*

Source: Ginton, N. (2014)

Between 1980 and 2014, empirical evidence suggests that Year 2014 witnessed the most expensive makeshift graduation hall (K73, 000) in the history of the University (Table 3). This accounts for about 21% of the entire K347, 000 spent by the University in that period to assemble and dismantle makeshift halls annually. Details of the expenses incurred in 2014 are indicated in Table 4.

Table 4. Shows the financial analysis of expenses on makeshift graduation hall in 2014

Materials	Cost	Period When Materials Used
Ropes	K20, 000 (2014)	Changed every 5 years
Stage Materials	K5, 000	Changed every year
Electrical Cables (lights, fans, etc)*	K3, 000	Used every year
Frame Hall	K5, 000	Since Makeshift Graduation Hall came into place
Canvas	K20, 000	Changed every 5 years
Sound System		Not charged
Labour Cost	K30, 000	Every year
Total	K73, 000 (excluding the Frame Hall)	

Source: Ginton, N. (2014)

As shown by the projected costs of K80, 300 and K88, 330 for the periods 2015 – 2019 and 2020 – 2024, it is contended that the expenses that the University might continue to incur in the foreseeable future on Makeshift Graduation Halls would be getting bigger and bigger. If this trend is considered along with the worsening financial situation of the University due to budget cuts, then it can safely be argued that the situation is no doubt unsustainable. These findings naturally prompt the next research question that this paper seeks to answer.

(ii) *What are the sustainable strategies and financial implications of a proposal to have the University develop a permanent graduation hall?*

The respondents were asked to indicate their support or otherwise for the construction of a permanent graduation hall on the Taraka campus of the University. Those who supported the idea as a means of solving the problems of accommodation shortage accounted for 70%, while others indicated that a permanent hall was needed to create more space (26.67%) and to serve only the purpose of graduating students (3.33%). It, therefore, becomes clear that the majority of those people interviewed for this study were in support of the construction of a permanent graduation hall in order to resolve the dilemma of rowdy graduation ceremonies. When asked to suggest strategies that the University could adopt in providing a permanent graduation hall, majority of the respondents (66.67%) indicated that such a hall should target provision of more parking facilities, while 13.33% indicated that if a makeshift hall would continue to be used, it should be relocated from the present car parking space to a more spacious location. Moving forward, and in line with the most popular opinion among the respondents, it is contended that

the most sustainable strategy that the University could adopt is developing a permanent graduation hall on a suitable site within Taraka campus that would afford all visitors the opportunity to park their vehicles safely and enjoy ample open space where they can comfortably relax and celebrate the occasion with their loved ones. What, then, are the financial implications of this proposal? To answer this question, we performed a development appraisal (residual valuation) to ascertain the viability or otherwise of the proposed project as well as arrive at the likely budget for a permanent graduation hall (Table 5).

Table 5. Development Appraisal (Residual Valuation) of a Permanent Graduation Hall (Unitech)

<i>Gross Development Value/Market Value:</i>	K	K
Net Annual Income (Hire fees from Conferences, etc.)	600,000	
Year's Purchase in Perp. @ 8%	<u>12.5</u>	7,500,000
Less Building Costs:		
(i) 1,052m ² @ K2,500/m ²	2,630,000	
(ii) Professional fee @ 10% of (i)	263,000	
(iii) Finance cost @ 9% of (i) + (ii) = X		
$[X \times (1 + i)^n] - X = K3,437,173 - K2,893,000$	544,173	
(iv) Contingencies @ 5% of (i), (ii) and (iii)	171,859	
(v) Developer's Profit (built-in as a cost)		
10% of GDV, i.e. 10% x K7,500,000	750,000²	
Total Budget		4,359,032
Residual		3,140,968
Less Acquisition Cost @ 5%		<u>157,048</u>
		2,983,920
x PV K1/in 2 years @ 9%		x <u>0.842</u>
Residual Land Value		K2,512,461³

Source: Authors, 2015

Notes:

1. Finance cost is calculated at a lending rate of 9% p.a., which the University should be able to negotiate successfully with a friendly lender. A development period of 2 years is assumed for the calculation using the compound interest formula.
2. A developer's profit of K750,000 built-in as a cost actually means a profit that can be treated by the University as spendable income or set aside for investment purposes.
3. In addition to the developer's profit, there is an excess amount of K2,512,461 that is more than enough to pay for the acquisition of the project site if the University were to buy the land, but such an expenditure is considered unnecessary because the University already owns a large tract of land at Taraka campus (202 ha). In that case, the sum of K2,512,461 could also be treated as a spendable income or set aside for investment purposes.

Having regard to the above, it is our considered opinion that the proposed permanent graduation hall will be a profitable investment for the University, a proposal that should be proactively

pursued to a logical conclusion. Comparing the total cost of K589,386 for erecting and dismantling a makeshift hall over the period 1980 – 2014 (Table 3) with no opportunity for generating any cash in-flows once the temporary hall is dismantled every year on the one hand, and the excess profit of K3,262,461 (K750,000 + K2,512,461) that is accruable to the University from the proceeds of a reasonably commercialised permanent graduation hall on the other hand, it is contended that the development of a permanent graduation hall is a relatively sustainable option.

Sensitivity Analysis

The World Bank compares a lending request for project funding against a set of criteria and indicators known as the sustainability matrix (World Bank, 1995). The sustainability matrix contains: (a) a set of criteria for measuring the economic and financial viability of a project (the developmental/growth dimension), and (b) a set of criteria for measuring the ecological and social sustainability of a project (the environmental/social dimension). However, while this is a positive step, Dumanski (1997) argues that the method still presents a number of challenges. According to Dumanski’s investigations, the actual indicators for the ecological dimension – such as ecosystem integrity, carrying capacity and natural resource conservation – are as yet poorly defined. Furthermore, Dumanski observes that the indicators of social sustainability – such as equity, social mobility, social cohesion, public participation, empowerment, cultural identity and institutional development – are even more poorly defined (Commonwealth Secretariat, London, 2007). Considering these notable criticisms against the sustainability matrix, the present authors decided to subject the viability findings in Table 5 to sensitivity analysis (Table 6) as widely practiced by asset valuers and development consultants (Kone, 2006; Ratcliffe and Stubbs, 1996; Rees and Hayward, 2000). This analysis is aimed at accommodating the risk of uncertainty in the real property market in Papua New Guinea during the proposed project’s development period and beyond, and to test the variability of the bid for land given any likely adverse movements in the following viability variables:

- (i) Annual rental income, assuming that the Hall would be rented out to raise funds;
- (ii) Investment yield, assuming a commercial property owned by a public university;
- (iii) Building cost, assuming that costs will increase at a rate of 10% p.a. in PNG;
- (iv) Finance charges, assuming that a friendly bank can provide loan at 9% p.a.; and
- (v) Development period, assuming that the project will be completed within 2 years.

Table 6. Sensitivity Analysis of Viability of the Proposed Permanent Graduation Hall

Sensitivity Variables	Optimistic scenario	Pessimistic scenario	Worst scenario
(i) Net annual income	K600,000	K500,000	K400,000
(ii) Investment yield	8%	9%	10%
(iii) Building costs	2,893,000	3,037,650	3,182,300
(iv) Finance charges p.a.	9%	9.50%	10%
(v) Development period	2 years	3 years	4 years
Residual Land Value	<u>K2,512,461</u>	<u>K291,243</u>	<u>-K1,271,907</u>

Source: Authors, 2015

The sensitivity analysis was performed by repeating the residual valuation in Table 5 two more times, while introducing new variables as shown in Table 6, and keeping other variables constant. It is obvious from Table 6 that the hypothetical worst scenario would be unsustainable for the university because it produces a negative residual land value (-K1,271,907), a very low annual rental income (K400,000), a very high cost of development (K3,182,300), a very high cost of borrowing (10% p.a.) and an unrealistically long development period of 4 years. The pessimistic scenario is not much better either, with a relatively low residual land value (K291,243) that is insufficient to buy a good site for the project, a rather low annual rental income (K500,000) and a fairly long development period of 3 years. Without doubt, the optimistic scenario appears to be the best option for the university, which is still achievable in view of the fact that this option has a developer's profit allowance that is already built-in as a cost in addition to the possible gains that can be achieved if the project is meticulously supervised by in-house professional engineers to reduce costs. Conversely, the worst case scenario is unsustainable and we would advise that the university refrain from implementing the project under such economic conditions. Based on the strengths and opportunities inherent in the optimistic or best case scenario, it is submitted that the proposed permanent graduation hall is a viable investment, which the PNG University of Technology should pursue to a logical conclusion.

(iii) *What are the likely impacts of a permanent graduation hall on both the University community and its corporate profile that may serve as lessons to similar institutions?*

The third research question is answered by recourse to impact assessment and analysis of market trends, with particular reference to similar projects in PNG and the South Pacific Region. Our further investigations revealed that the proposed permanent graduation hall is capable of enhancing the socio-economic, cultural, educational, research, environmental and corporate profile of the University, directly or indirectly. Our investigations also revealed that the potential benefits of the project will surpass the financial and other costs of the project, as the following evidence reveals:

- *Rental incomes*

The permanent graduation hall will be designed for a capacity to host huge events or gatherings like expos, crusades, international conferences, other schools' graduation ceremonies, provincial group celebrations, concerts, students' or staff forums, etc., which thus require that the crowd be properly accommodated. These events can be hosted by the Papua New Guinea University of Technology on reasonable rental basis to generate income to the institution for running some of its services.

- *Safety and convenience of use*

We envisage that *green design* or *sustainable design* will be adopted by the University as the philosophy behind the design and construction of the permanent graduation hall and its supporting facilities and services in order to make them comply with the principles of social, economic, and environmental sustainability. To address and comply with the "green design" or "sustainable philosophies", the buildings and associated facilities should be designed intentionally to eliminate negative environmental impacts, taking into account a 2-year project development period, energy efficiency, good inside-outside feeling, sky lighting-natural lighting to minimise heat on the roof, cost-effective use of building

materials that are maintenance free, sound structural analysis to withstand earthquakes and tremors, and spatial functionality (Rubenstein, 1996; Page, *et al* 1992)

- *Cleaner environment*

Health and safety issues, including natural ventilation should be guaranteed. Since the facility will serve huge crowds that may well include sweating sportsmen and women, it should be designed to be “naturally ventilated,” in orientation to the north-east and south-west winds allowing cross-ventilation to be addressed. Besides, fuel consuming mechanical equipment should be limited in preference to an overall design strategy that is cost-effective and capable of addressing air pollution, while also keeping the occupants comfortable as much as possible.

- *Avoidance of unnecessary hassles*

The unnecessary yearly hassles with moving materials during installation and dismantling of the makeshift hall would be avoided. This would also save time, labour, funds as well as minimise safety issues.

- *Improved Corporate profile*

If the above recommendations could be thoughtfully implemented, it is almost certain that the Papua New Guinea University of Technology’s profile would be enhanced substantially. Taking into account several recent key projects designed by the University to “Make Unitech Fly”, including the recently installed O3B Internet project, the on-going academic programs accreditations, the external linkage programs, amongst others, it is hoped that a state-of-the-art permanent graduation hall is an investment in the right direction, which all the University’s stakeholders would proudly welcome and support.

6. Conclusion

This study was designed for two main purposes, namely: first, to advance the potential of corporate real estate (CRE) strategy in promoting the sustainability of large organisations; and, second, to use the viability of a permanent graduation hall at the Papua New Guinea University of Technology’s Taraka campus as a springboard for synergizing the corporate real estate strategy of the university. It is submitted that if a study of this nature is not carried out now, the university and its stakeholders may continue to encounter the lingering problems associated with the yearly graduation ceremonies that are held in a makeshift graduation hall. Such problems would most likely be accentuated by the huge expenses annually incurred in the process of erecting and dismantling a makeshift hall and the budgetary cuts that the university might continue to face in the foreseeable future. This study is important because the continued lack of a permanent graduation hall at the Papua New Guinea University of Technology can mean a continuation of the status quo that could prevent the university from enjoying a high corporate profile, an improved revenue generation, a competitive academic rating, and high staff-student morale necessary to “Make Unitech Fly”. Here lies the relevance of the “sustainable corporate real estate strategy” that has been advanced as the conceptual framework for this paper.

An attempt has been made to answer three research questions as a means of contributing to the literature, based on relevant data analysis of the past performance and characteristics of makeshift graduation halls that have been used by the university to host graduation ceremonies,

at least in the last three decades. The first research question examined whether the current practice of using a makeshift hall for graduation ceremonies at the Papua New Guinea University of Technology is sustainable. When asked for their perceptions about the idea of the university hosting graduation ceremonies in a makeshift hall, 70% of the respondents indicated that hosting graduation ceremonies in a makeshift hall was not good; 20% of respondents indicated that it was good and 3% indicated that it was very good. Only 3.33% of the respondents indicated that hosting graduation ceremonies in a makeshift hall was reasonable and acceptable. When asked whether they had experienced any space problems during the past graduation ceremonies, the respondents overwhelmingly indicated “Yes” (96.67%) on the questionnaire, while only 3.33% indicated “No”. Furthermore, when the respondents were asked to indicate reasons for their perceptions, more than half of the respondents (66.67%) complained about insufficient sitting capacity inside the makeshift hall, about 27% indicated that the space inside the Hall was too humid, while 16.67% detested the shortage of good parking facilities around the graduation arena. The second research question sought to establish whether there are any sustainable strategies that could be used for implementing the proposal to develop a permanent graduation hall and the financial implications of such strategies. Respondents who supported the idea of a permanent graduation hall as a means of solving the problems of accommodation shortage accounted for 70%; those who indicated that a Permanent Hall was needed to create more space were 26.67%, while those who thought that a Permanent Hall should only be reserved for the purpose of graduating students were 3.33%. In any case, all the respondents supported the idea of building a permanent graduation hall.

After applying historic and projected costs data (1980 – 2024) to prove that the continued use of a makeshift hall is unsustainable for the University in the long term, the authors went on to conduct a development appraisal (residual valuation) to verify whether a permanent graduation hall would indeed be a better and sustainable alternative. Comparing the total cost of K589,386 for erecting and dismantling a makeshift hall over the period 1980 – 2014 with no opportunity for generating any incomes once the temporary hall is dismantled every year, and the excess profit of K3,262,461 ($K750,000 + K2,512,461$) that is accruable to the University from the proceeds of a reasonably commercialised permanent graduation hall, it is contended that a permanent graduation hall would by far be a better option for the University in the prevailing circumstances. In order to affirm the results of the viability analysis, the residual valuation was subjected to a sensitivity analysis under three hypothetical scenarios of optimistic, pessimistic and worst economic and real estate market conditions in Papua New Guinea. The optimistic scenario was found to be a realistic option provided that the university will be able to adhere to the development budget and manage the completed hall cost-effectively.

The third research question was aimed at identifying the likely socio-cultural and environmental impacts of a permanent graduation hall on both the University community’s corporate profile and on the local community in a way to serve as good lessons to similar corporations. The authors’ approach to answering this last research question was to rely on impact assessment methodology and analysis of current market trends in PNG and the South Pacific Region. Findings revealed that the proposed permanent graduation hall is capable of enhancing the socio-economic, cultural, educational, research, environmental and corporate profile of the university, directly or indirectly. More specifically, the proposed project if pursued to a logical conclusion has the capacity to yield substantial rental incomes to the university and guarantee a better environmental quality and improved health and safety through the adoption of a *greenorsustainable design*. Furthermore, the project will promote a cleaner environment,

avoidance of unnecessary hassles inherent in the annual installation and dismantling of a makeshift hall, and a higher corporate profile, all of which are essential ingredients for the actualisation of the “Making Unitech Fly” vision of the Papua New Guinea University of Technology.

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