



# Mapping the East African Proptech Ecosystem

*A Focus on Kenya, Tanzania and Uganda*

*The Urban Real Estate Research Unit in  
collaboration with Proptech Africa*

*By Sean Godoy*

## The Urban Real Estate Research Unit

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# MAPPING THE EAST AFRICAN PROPTech ECOSYSTEM

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## Introduction

The Urban Real Estate Research Unit ([URERU](#)) at the University of Cape Town has been following the development of proptech for the past 2 years. The global proptech ecosystem<sup>1</sup> has experienced exponential growth in recent years as the many benefits around tech-enabled interventions have become clearer to real estate stakeholders. As a result, the business of real estate has begun to transform, and proptech is now an important consideration within any real estate strategy. The question is no longer around what proptech is, but instead how best to adopt it. This underlines the importance of understanding the proptech ecosystems that are forming within our real estate markets. As such, this report, the second step on our mission to map the African proptech ecosystem, attempts to identify the scope and range of proptech activity in East Africa.

Proptech has an important role to play in African real estate markets due firstly to the benefits that have been proven in global markets; and secondly in terms of addressing key challenges and inefficiencies in property markets across the continent. For example, the World Bank's Ease of Doing Business Index has identified key issues within the real estate industry (such as construction permitting, registration procedures and obtaining credit) which hamper the efficiency of markets in African property markets. Different areas of proptech are able to provide solutions to these challenges by applying tech-enabled interventions (e.g. big data, AI, the sharing economy).

Some are unique to real estate and some are shared with other sectors such as finance and its related fintech interventions. At the same time proptech can be described as a transformative technology, or one which enables leapfrogging within the property sector in terms of innovation and development, hence its importance to emerging markets. In reality this can mean overcoming key challenges as well as creating new opportunities in ways that are more accessible and more efficient than current market arrangements. As real estate markets grow in importance in emerging economies, proptech will increasingly become a crucial part of how they operate.

Encouragingly, players in real estate markets across the African continent are becoming increasingly aware of the role that proptech can play. Since the release of our inceptive [South African proptech report](#)<sup>2</sup> in February 2019, anecdotal evidence suggests that the proptech ecosystem across Africa has witnessed a steady rise in activity and investment. What's more

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<sup>1</sup> A tech ecosystem is an interconnected, interdependent network of various actors that combine to create innovative products and services in tech, or proptech in this instance

<sup>2</sup> 42 proptech companies were identified in the South African proptech ecosystem in February 2019, while our recent research shows that this number could now be close to 60

is that the conversation around this topic within the wider real estate and technology communities is accelerating. So far there has been little information available about the proptech ecosystem in the East African region. This research report aims to highlight the current activity and opportunities for proptech by mapping the ecosystem in this dynamic region. This is important because proptech represents a significant opportunity for innovation in real estate markets with the ability to impact the way that business is done.

Originally, the geographic scope only included Kenya, the region's economic hub, but as the research started it became clear that it would be important to include Tanzania and Uganda in order to cover a reliable East African sample. This subject region is referred as KTU (Kenya, Tanzania and Uganda) for the purposes of this report. The objective of this research was to identify as many active proptech-related companies as possible and then categorise the sample according to the type of service or product offered. Thereby providing an insight into the overall ecosystem. As with the similar research undertaken for South Africa, the results have shown an exciting proptech ecosystem that is both active and developing.

In terms of structure, the report considers the global proptech sector and then introduces Kenya, Tanzania and Uganda in terms of their economies and technology sectors. The report more generally considers the proptech ecosystems in the region, forming the basis from which to explore proptech in more detail through identifying and categorising the type of proptech activity in KTU. Finally, the conclusion highlights the increasing evidence that the region is taking control of its own proptech conversation while also interacting with international developments. In total, 51 proptech companies were identified with the majority of activity taking place within the Services and Software, and Sales and Lettings categories. In addition, 49 coworking or flexible space providers were identified in the region.

## What is Proptech?

To begin, it is important to consider proptech in a broader sense as a point of departure for this report. When defining proptech we subscribe to key insights from our initial report based on South Africa which was released last year. Namely, the linkages of technologies across disciplines has seen an exponential growth of technological advancement over the past decade which has affected most industries (commonly referred to as the fourth industrial revolution). While the real estate industry has generally been slower to react to this trend, globally there has been an increasing rate of adoption of technology within real estate and, as a result, the number of real estate-related technology companies are growing at a rapid rate.

This has led to the emergence of proptech within real estate, which put simply refers to technology that aids or improves the way in which the business of property is carried out. The actual definition of the term proptech, as with most tech-related buzzwords, comes in many forms which are usually influenced by the author's professional background, skills and objectives. For clarity, URERU's own take on the definition is as follows;

*Tech-driven innovation that is related to buildings and the real estate industry at large. This is tech that influences real estate in terms of design, management, transactions, investment and use.*

URERU & SA Proptech

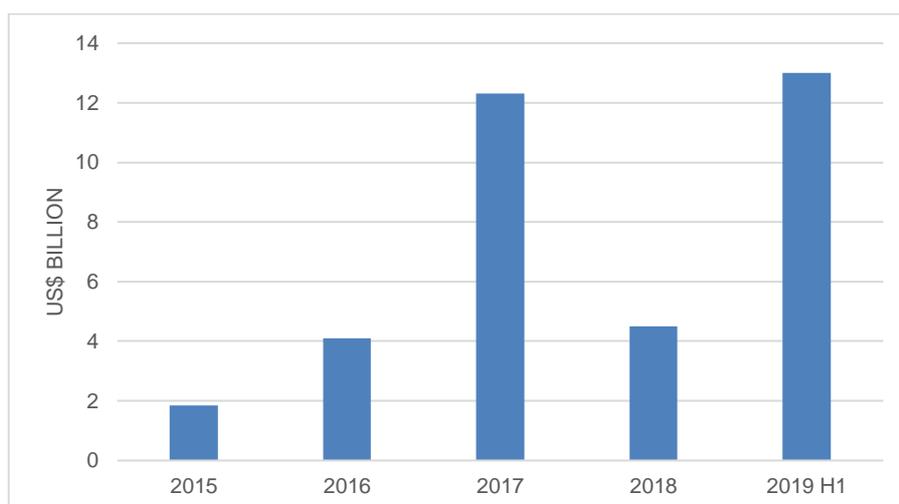
This definition focusses on the real estate value chain from the perspectives of owners, users and service providers. It considers any tech-enabled interventions that operate within key areas of the value chain, often impacting the way real estate products or services are developed and executed. The construction sector is an integral part of the overall built environment arena, and while it is closely related to real estate, it is considered separate from proptech for the purposes of this report. Instead, tech-driven innovation in construction is often referred to as its own ecosystem called contech.

Proptech in Africa is largely considered to be at the early stages of its development, as opposed to other more advanced global regions such as Europe and North America. However, it has an important role to play in improving market efficiencies on the continent, namely around the availability of information, high transaction costs and valuations. Thus, it is important to consider global proptech trends in order to provide a context for the activity in Africa. This will be discussed briefly in the following section.

## **Snapshot of Global Proptech Activity**

Global proptech activity is expanding at a rapid pace as the need and value associated with innovation in the real estate industry becomes increasingly evident through proptech successes such as AirBnb. This is because successful proptechs are creating new ways to operate in real estate and thereby creating new forms of competition within the industry. According to CRE Tech, a global proptech research and events company, global proptech investment peaked at over US\$12 billion in 2017 before dropping in 2018 in line with largely subdued global economic conditions. However, total investment in the first half of 2019 already exceeded the historic peak in 2017, as per the graph below.

Figure 1: Global Proptech Funding



Source: CRE Tech

Furthermore, the latest data for quarter three of 2019 recorded investment of US\$6.47 billion over 181 deals, a 41% increase on quarter two<sup>ii</sup>, which means 2019 has already experienced the highest ever annual investment in proptech; close to US\$20 billion. The top three most active investors were Colliers-Techstars<sup>iii</sup>, Founder Fund<sup>iv</sup> and Khosla Ventures<sup>v</sup> which means that their investment books should contain an interesting array of promising proptechs.

The recent levels of investment demonstrate a very clear upward trend which indicates growing confidence in the current and future potential of proptech. While these figures may still be a small portion of overall startup or tech investment, the positive trajectory of proptech is undeniable. It should be noted that there are a number of reliable sources for global proptech funding whose data does not often correlate<sup>vi</sup>. This is due to the challenge of recording investment that contains a large amount of private activity that is difficult to track and record. We chose CRE Tech due to its history and credibility within the sector, although it can be useful to compare the different sources available depending on the context. That said, the trends and numbers presented speak for themselves and all trends are largely pointing up.

## Africa, the Final Frontier

The promise and attraction of Africa's potential has peaked and waned over the last decade, but as Knight Frank highlighted in their prominent 2019 Africa Horizons report the continent may be entering a new cycle<sup>vii</sup>, which is one of the key economic themes it identifies. According to the African Development Bank, economic growth in 2019 was forecasted to accelerate to 4%, up from 3.5% in 2018. East Africa is expected to experience the strongest growth at almost 6%, extending a prolonged period of outperformance by the region, where economic success is led by diversification.

Looking ahead to 2020, the IMF expects overall growth for the continent to taper down slightly to 3.8%, weighed down by the economic underperformance of its two largest economies; Nigeria (2.5%) and South Africa (1.1%). However, drilling down to a country level there are 11 countries that are expected to achieve economic growth of 6% and above, with South Sudan achieving the highest forecast of 8.2% followed closely by Rwanda with 8.1%. In addition, the African Continental Free Trade Agreement could provide a further boost to the continent's economy through the proposed removal of 90% of tariffs on goods moving between 49 countries, and liberalising trade in services.

The Knight Frank report also highlighted the role of rising affluence in Africa. According to Oxford Economics, by 2023 more than 46% of African households will have an annual income of over US\$5,000, up from 41% in 2018, while the number of households with an income of over US\$20,000 is forecast to rise by 32% to 17 million over the same period. This is likely to result in greater consumerism, and more sophisticated patterns of spending and private investment, particularly as stronger growth is expected for higher income bands.

Lastly, the report highlighted the Fourth Industrial Revolution (4IR) as a key theme in terms of increasing innovation and thereby fuelling economic growth through new opportunities, increased efficiencies, improved competitiveness and improved access. A significant amount of research has shown that technological innovation, economic growth, and overall human wellbeing are intricately linked, which means that a degree of disruption today often leads to a better overall quality of life tomorrow<sup>viii</sup>. This trend provides a solid foundation for tech-related innovations across a variety of industries, including real estate and proptech. Therefore, policies that encourage experimentation, learning, human capital accumulation, and risk-taking can pay huge dividends in the form of future economic growth<sup>ix</sup>. Hence, it is encouraging to see many African countries embracing technological innovation at a high level, such as Tanzania with the Commission for Science and Technology (Costech) and Uganda with the ICT Ministry.

Furthermore, encouraging signs of the tech revolution on the continent are abundantly evident. In 2019, internet technology behemoth Google opened its first African artificial intelligence laboratory in Accra; joining Paris, Tel Aviv, and San Francisco, while their Launchpad Accelerator programme offered support and advice to start-ups in 17 African countries. Meanwhile, Csquared has been constructing fibre optic networks in cities including Accra, Entebbe, Kampala and Monrovia. Both Google and Csquared are part of the Alphabet Inc. group of companies, representing some of the most innovative organisations in the world. Some argue that Africa represents the last frontier for technological innovation, and with firm commitments from the abovementioned global tech leaders as well as local and national governments, the African frontier represents a massive opportunity. The next section turns the focus to East Africa which features strongly on the continent in terms of economic growth and technological innovation.

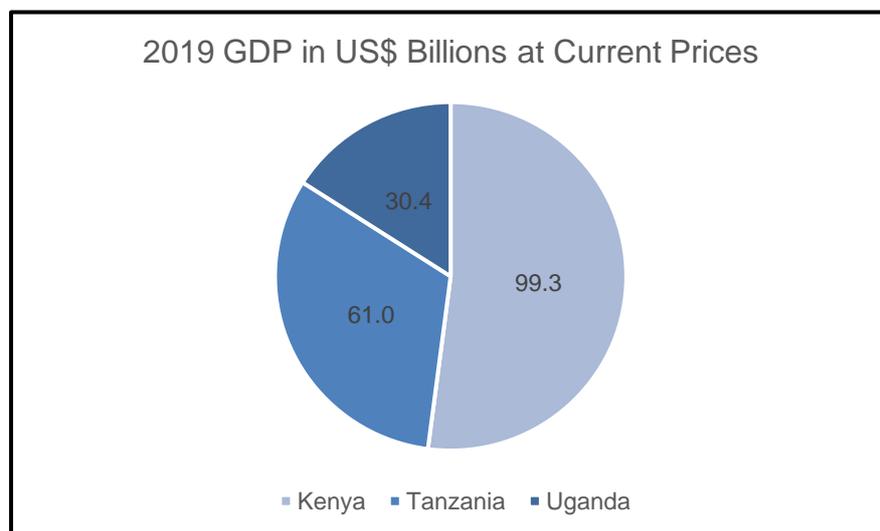
## Background to East Africa: Kenya, Tanzania And Uganda – KTU East Africa

The focus of the report is on East Africa, more specifically; Kenya, Tanzania and Uganda, hereon referred to as KTU. The three countries make up a significant portion of East Africa’s population with their combined population estimated at over 140 million people in 2019 according to data from the IMF<sup>x</sup>. They are part of the East African Community (EAC)<sup>xi</sup> region which also includes Rwanda, Burundi and South Sudan.

The countries all share borders as well as the largest lake in Africa, Lake Victoria, and are well known for their natural beauty and extensive wildlife which are key drivers of tourism. KTU has also become known as a gateway to East Africa, and the continent, with the Africa Headquarters for the UN located in Nairobi as an example. The KTU region is also regarded as having relatively stable political and economic environments, good access to other key African regions and a reputation for technological innovation. These attributes contribute strongly to KTU’s overall appeal.

In terms of their economies KTU share an interesting relationship between the sizes of their GDPs. Kenya has the largest economy in terms of GDP, while Tanzania is roughly two-thirds of this, and Uganda one-third as illustrated by Figure 2. The main economic contributors include agriculture, mining and industry, construction and the services industry. Overall, these three economies form an important part of the economic landscape in East Africa.

Figure 2: GDP Size for KTU



Source: IMF, World Economic Outlook Database, April 2019

The tables below contain key economic statistics for each country and their estimated growth from 2019 to 2024. This provides an insight into economies that are dynamic and growing.

**Table 1: Key Economic Indicators for Kenya**

Variable	Current 2019	2024 Estimate	Change
Gross domestic product, current prices, USD Billions	99,3	153,2	54%
Gross domestic product per capita, current prices, USD Units	2010,5	2714,8	35%
Inflation, average consumer prices, % Change	4,4	5	0,6
Population, Persons	49,4	56,4	14%

**Table 2: Key Economic Indicators for Tanzania**

Variable	Current 2019	2024 Estimate	% Change
Gross domestic product, current prices, USD Billions	61,0	84,2	38%
Gross domestic product per capita, current prices, USD Units	1172,2	1465,2	25%
Inflation, average consumer prices, % Change	3,5	4,9	1,4
Population, Persons	52,1	57,5	10%

**Table 3: Key Economic Indicators for Uganda**

Variable	Current 2019	2024 Estimate	% Change
Gross domestic product, current prices, USD Billions	30,4	47,9	58%
Gross domestic product per capita, current prices, USD Units	759,1	1032,2	36%
Inflation, average consumer prices, % Change	3,6	5,0	1,4
Population, Persons	40,0	46,4	16%

Source: IMF, World Economic Outlook Database, April 2019

While the size of their economies may be relatively small (South Africa's GDP is around US\$350bn – more than triple that of Kenya), the projected rate of growth is significant and likely to create a variety of opportunities across most industries. Coupled with this is controlled inflation and steady population growth which all together provides a positive outlook for KTU.

The key contributors to Kenya's economy are agriculture, transport, and manufacturing and trade which collectively account for around 57% of total GDP<sup>xii</sup>. Real estate is currently a healthy contributor at 7%, although this is down slightly from 8% in 2014. Information and Communications Technology (ICT) is a minor contributor and has remained largely constant, currently contributing 1.2% to total GDP. In Tanzania, key contributors to the economy are agriculture, construction, manufacturing and trade which together account for around 58% of total GDP<sup>xiii</sup>. Real estate is a maturing industry and currently makes up 3% of GDP, down from 4% in 2012, while ICT is a minor contributor which since 2012 has contributed an average of around 2%. Lastly, the key economic contributors in Uganda are agriculture, manufacturing, trade and construction which together account for 53% of total GDP<sup>xiv</sup>. Real estate is a strong contributor that currently contributes 6.2% to GDP while ICT contributes 2.1%, both of which have remained fairly constant since 2015.

A healthy portion of KTU's economic activity can be attributed to real estate while ICT features to a lesser degree but shows significant promise. These two sectors are key elements of proptech and, when coupled with strong economic and population growth, provide a solid foundation for the future growth of tech-driven innovation in real estate. This needs to take place within a healthy culture of innovation which will be explored in the following section.

## A Brief Summary of the Innovative Landscape of Africa and KTU East Africa

Proptech draws on a variety of areas of technological innovation from different industries. Therefore a strong tech sector consisting of a culture of experimentation, skilled tech workers and innovative entrepreneurs and companies is an important element of the foundation for any proptech ecosystem. Hence, having an understanding of the overall tech landscape in this region provides a firm base from which to further examine proptech in the region.

There is a significant amount of media content focussed on Africa being created on tech, startups, innovation and a host of other factors that contribute to 4IR<sup>xv</sup>. This activity provides strong anecdotal evidence of the large scale of activity taking place within these crucial sectors. The fourth industrial revolution is a topic that attracts many passionate supporters as well as many sceptics, however, what is clear is that the digital economy is changing emerging markets and the businesses within them in a significant way. This all points to a strong foundation for a host of tech-enabled innovations within key industries such as fintech (finance technology) and of course proptech (real estate technology).

Overall, the way business is done is changing rapidly, from the way businesses operate, identify opportunities and stay relevant, to how they hire and motivate staff. It is becoming increasingly less a case of business as usual but rather a constant need to innovate to stay relevant and competitive. Africa is well placed to take advantage of the new opportunities created by these trends due to the tech savvy nature of many countries, a young population and numerous proven successes backed by various private and public sector initiatives providing firm support to the cause. Investors are increasingly aware of this opportunity and are directing growing amounts of capital into the continent. According to a recent report by French venture capital firm [Partech Africa](#), 146 African tech startups raised US\$1.163-billion in equity funding over 164 rounds, marking what it said is a 108% year-on-year growth in funding raised by tech startups on the continent in 2018<sup>xvi</sup>.

Linked to this, a reliable indicator of this tech activity on the ground is the number of tech hubs that can be found in a specific geographic area. Tech hubs can be defined as organizations with physical addresses which offer support and facilities for tech entrepreneurs such as incubators, accelerators, university-based innovation hubs, maker spaces, technology parks, and co-working spaces. A recent report by the GSMA Ecosystem Accelerator program and Briter Bridges<sup>xvii</sup> identified 618 active hubs on the continent in 2019, up from 442 recorded in 2018 (a 40% increase) and 314 in 2016 (a 97% increase).

In terms of total tech hubs, Kenya comes in fourth on the continent with 48, behind Egypt (56), South Africa (80) and Nigeria (85), aptly named Africa's 'innovation quadrangle'. Tanzania comes in 10<sup>th</sup> place with 17 hubs. Uganda did not feature in the top 10, however, it is showing promising signs of growth in this area as discussed later in the report. Together, this highlights the prominence of the KTU tech and startup ecosystems and the role they have in driving innovation on the continent, including proptech.

## Kenya

Innovative trailblazer Kenya is home to one of the oldest and most flourishing startup scenes on the continent<sup>xviii</sup> and is in many ways a leading light for African tech innovation. Home of mobile money service M-Pesa, crisis mapping tool Ushahidi and tech incubator iHub, these local inventions are largely attributed with having triggered digital participation and given the country a reputation for developing digital solutions<sup>xix</sup>. Furthermore, Kenya houses the 4<sup>th</sup> highest number of tech hubs on the continent (mentioned previously), while it was ranked as the second leading innovation hub in Sub-Saharan Africa by the World Intellectual Property Organisation in its latest Global Innovation Index (GII)<sup>xx</sup>. A unique and encouraging characteristic of the Kenyan tech sector is that it does not just look to what is happening in the 'West' but innovates around local problems that provide locally relevant tech-based solutions.

Many industry leaders prophesise that Kenya's economic hub and capital city, Nairobi, is well positioned to become the San-Francisco of Africa as part of the Silicon Savannah. Though this title is hotly contested between an impressive group of cities leading in their own ways, including: Lagos, Johannesburg, Cape Town and Cairo<sup>xxi</sup>. Nairobi hosts a thriving startup community that is active in fintech, agritech and proptech, to name a few. Facebook has voiced firm commitment to the country and region, observing that there are a lot of young people in Kenya who see the transformational opportunities of emerging technologies and have a good number of local heroes and role models that have built interesting and successful business models around technological innovations<sup>xxii</sup>.

As a snapshot into the type of industries that tech startups are tapping into, Digest Africa ranked the twelve most funded startup companies in Kenya at the end of 2019 which have collectively raised funding amounting to US\$293m across 32 rounds. Four of these operate in the fintech space, two in energy and sustainability, two in e-commerce, two in logistics, one in agriculture and one in telecoms<sup>xxiii</sup>. Each of these categories represent key industries and the diverse nature of opportunities for technological innovation not only in Kenya, but in the KTU region overall, due to the countries overall prominence. We expect proptech to feature more prominently in the near future based the strong levels of overall tech innovation and the significant role that real estate plays in the Kenyan economy (currently 7% of GDP).

## Tanzania

Despite Kenya establishing itself as a tech powerhouse in East Africa, Tanzania is fast becoming a leading light for innovation in the region in its own right<sup>xxiv</sup>. The aptly named Silicon Dar in the capital Dar es Salaam has cemented its place as the home of the country's thriving innovation ecosystem, describing itself as a community of innovators, technology enthusiasts and entrepreneurs<sup>xxv</sup>. Silicon Dar is located in the heart of Dar es Salaam's tech centre which is home to the headquarters of major telecoms Tigo, Vodacom, Tanzania Telecommunications Corporation (TTCL), Zanzibar Telecom (Zantel), Halotel and Airtel Tanzania. In addition, public enterprises such as the Commission for Science and Technology (Costech), the

College of ICT at the University of Dar es Salaam, Buni Hub and the TTCL data centre are located here.

The concentration of tech-focussed organisations in the area creates significant potential for collaboration and is likely to result in an increase in general tech activity. In 2011, Silicon Dar represented only two innovation hubs and one business incubator. Today there are around a dozen innovation hubs there. This has happened organically due to a unique mix of resources, skills and relevant sectors in the area. What's more is that this growth shows no signs of slowing<sup>xxvi</sup>.

While Tanzania's ICT ecosystem is evolving, common barriers remain in the form of unreliable electricity supply, poor infrastructure and limited transport links. However, there is strong political support for the ecosystem as evidenced by Tanzania's Commission for Science and Technology (Costech) recently pledging support for a smart city concept in Dar es Salaam which has the potential to reduce these barriers and spur further growth in the Silicon Dar ecosystem. This is encouraging activity overall, although there is yet to be a significant increase in tech-related content for Tanzania, hence the limited data and insight that is available.

## Uganda

While the overall innovation sector in Uganda is relatively small, encouraging activity and public sector initiatives are prevalent. Research by the ICT Ministry in 2018 shows that technology has underpinned Uganda's development by improving public and private sector service delivery; providing better access to information, knowledge and communication; creating jobs and reducing poverty; and spurring economic growth by boosting exports<sup>xxvii</sup>. The ICT sector has grown 19.7% on average each year since 2013 to 2018, adding 2.5% annually to the country's gross domestic product.

Our research also highlighted a number of key developments which have enabled this growth. The improved legal, technical and regulatory environment has encouraged a growing number of Ugandans to embrace ICT and automated business services, which has greatly improved service delivery and contributed to national development through reduced time to access services, improved transparency, reduction of human interaction and increased accountability. Interesting examples of meaningful innovations include an e-immigration system that has slashed the time to process work permits from 30 days down to four, while more than three million work-hours have been saved due to automated ordering and 'last mile' delivery for antiretroviral medication to treat HIV/AIDS. Meanwhile, the costs of crucial internet bandwidth have dropped thanks to the creation of a national fibre optic network, liberalization of communication services and an improved legal and regulatory environment

While Uganda's ICT market is expected to have grown 70% between 2013 and 2020, significant challenges also lay ahead. These include limited financial resources, fragmented ICT initiatives, inadequate facilities, the duplication of tech systems, inadequate public-private partnerships, expensive data and skills gaps caused by a misalignment of academia and

industry (and possibly conditions in the broader education system). However, it is encouraging that there is a clear drive by the public sector to encourage growth and activity in the innovation sector, as evidenced by the commencement of the ACIA innovation awards by the Ministry of ICT which largely focuses on agriculture, health and public management<sup>xxviii</sup>. This bodes well for the future of the sector and Uganda's role as a key innovation hub within East Africa.

Overall, innovative tech activity is predominantly concentrated in Kenya although encouraging indicators are present in both Tanzania and Uganda. This highlights the strong probability of future growth in these two countries. In addition, there is strong support for driving innovation from both the public and private sectors across KTU which bodes well for activity in the region as a whole. For these reasons, it is clear to see why Knight Frank believes that the so-called Silicon Savannah of East Africa will have a role to play in the global advancement of the next wave of technology. Importantly, the innovative landscape that is clearly evident in KTU provides a solid foundation for proptech to flourish.

## Proptech Ecosystem in KTU East Africa

### Methodology – The Process

Despite the growing interest and activity within tech and proptech across the African continent, formal research focusing on proptech in the African context has been limited. Though it is encouraging to see that this started to change in 2019. Examples of current research in this space include our own proptech report on South Africa, interesting work from Nigeria-based real estate data and insight company Estate Intel on the West African proptech ecosystem<sup>xxix</sup> and, most encouraging, an increase in proptech related papers presented at the 2019 African Real Estate Society (AFRES)<sup>xxx</sup> conference held in September 2019. The aim of this report is to provide the second step of many to understanding the proptech ecosystem across the continent and lay the foundations for future in-depth research.

In terms of the methodology, we largely followed the approach taken in the South African research and were also influenced by the work undertaken by international proptech thought-leader Professor Andrew Baum at the Saïd School of Business at Oxford University (Proptech 3.0<sup>xxxi</sup>). We started by gathering a list of active proptech companies by speaking with industry experts and consulting relevant online sources. This involved starting with the proptech companies we were aware of and building on them by speaking to entrepreneurs and businesspeople behind the scenes and searching for similar companies that may exist. Next, we divided these companies into relevant categories according to the type of service or product they offer. Finally, at a high level, we evaluated the activity taking place in each category in order to identify any key trends taking place. For example, online listing platforms moving from purely property search functions to digital sales or letting processes.

In terms of categorising the different areas of proptech, we started by considering the three key ways in which technology has been changing the world of real estate according to Professor Andrew Baum. Firstly, technology in property is '*cutting out the middleman*' by way of peer to peer services or products, crowdfunding and the sharing economy. A good example

is Airbnb which utilises a platform to connect landlords and renters in the short-term property rental space, negating the need for rental agents. A further example is crowdfunding where funding is raised on a peer-to-peer basis via an online platform (e.g. The House Crowd in the UK) or actual property investments are offered (e.g. Property Partner in the UK).

Secondly, technology is '*driving innovation in property uses*' by way of cloud working (e.g. Google Drive & Google Docs), coworking, immersive technology (e.g. VR & augmented reality) and the online retail revolution, including click and collect or delivery (e.g. Takealot in SA). These factors are having a significant impact on how we use space, from virtual meetings aiding remote working, to 'on-demand' office rental through coworking, sometimes on an hourly basis. Global car rental company Zipcar uses the same model for car rental in large metros where cars can be unlocked with your smartphone and rented per hour, all via an easy-to-use app.

Thirdly, '*technology is driving the efficient use of space*' by way of the internet of things or IoT (e.g. Vula Telematix in SA), smart buildings (e.g. Lone Rooftop in the UK and Nuru in SA) and smart cities. These proptech solutions aid the efficient use of space in various ways, from providing live measurement of the usage of physical space and utilities in order to reduce wastage, to identifying space that could be temporarily leased on an 'on demand' basis. There are significant crossovers with better buildings within this, where connected and live buildings can provide a degree of measurement and control, much of it reactive or proactive using data from sensors. On a larger scale, this connectivity can be applied to a whole city which is a fundamental component of a smart city.

In summary, we considered relevant global research within the local context when determining our proptech categories. By drawing on work that has been done in more mature proptech markets we aimed to assess the level of the KTU market and determine the most active areas of the sector. As the research develops in an African context and when there is a greater understanding of the types and range of proptech activity, we will look to create categories that are developed out of the African proptech landscape as opposed to taking categorisations from the Global North, although this is a useful point of departure for the embryonic stage of African proptech research.

## The Findings

The findings will be presented for each category, including a breakdown of the number of proptech companies active in each country. The findings will also be accompanied by insight provided from the various interviews and research conducted on the study region. The categories of the findings include: Services and Software, Sales and Letting, Digital Innovation, Data and Analytics, Crowdfunding and Finance, and Coworking or Flexible Space.

The results of the research depict a burgeoning proptech ecosystem in KTU where promising activity is evident, as well clear areas of opportunity driven by a need for innovative solutions in real estate markets with varying levels of maturity. In total we identified **51** companies demonstrating proptech characteristics and **49** coworking or flexible office providers. In line

with Kenya's larger economy and thriving tech sector, it leads in terms of the level of activity and innovation. Tanzania and Uganda together show pockets of proptech activity, although overall their real estate markets seem to be operating in a mostly traditional manner, including a degree of informality common in most industries, and are still maturing in many ways.

For this reason, proptech activity was sometimes identified within established real estate companies which indicates that innovation is partly being driven from within the real estate industry itself, as opposed to externally by tech stakeholders. On a global scale, external tech stakeholders usually drive proptech innovation while traditional real estate companies then play catch-up by adopting these technologies or developing their own. For example, global real estate services company JLL first embraced the external proptech environment by launching its own proptech-focussed investment fund (JLL Spark), and then recently created a new technologies division to house all of its proptech products and investments (JLL Technologies)<sup>xxxii</sup>. This highlights how proptech is no longer viewed as something that is exclusively external to real estate firms and is starting to become embedded within their practices.

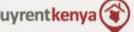
In essence, tech startups originating outside of the real estate industry tend to develop services or products that disrupt the industry in some way, which are then either acquired or replicated by established real estate companies (e.g. CBRE's flexible office brand Hana<sup>xxxiii</sup>). For this reason, we were faced with identifying proptech companies that were not always standalone operations and therefore decided to include traditional real estate businesses that demonstrated a level of proptech innovation. This provides a more accurate view of overall proptech activity in our view, especially for such a report which aims to provide a foundation for further research. Furthermore, a number of companies were identified that offer more than one innovative proptech product or service, which generally points to a developing market where first-movers are expanding their services quicker than brand new startups. This is in line with the high-levels of entrepreneurship in these markets which is often driven by need and a tenacious do-or-die attitude which is ubiquitous in many developing countries.

The main product of our findings is the below proptech map which presents the logos of all the identified companies divided into categories according to the type of service or product they offer. The findings for each category will now be discussed.

# The KTU Proptech Ecosystem March 2020

Compiled by  URBAN REAL ESTATE RESEARCH UNIT

in association with 

Category	Kenya	Tanzania	Uganda
Services & Software	 Obulex  SOJA  Digital Age Solutions Ltd  DewCIS  Kodisher  SmartKodi  MEIWAY LENTA  Ezen Financials  JREM  SQUAREAPPLE  RESWA  Knight Frank  CENTURIA  e-kodi.	 powercomputers	 GANDAPPS  MIAH
Sales & Letting	 STAR Classifieds  property 24  Roometo  PROPERTYKES AFRICA  buyrentkenya  flats  e-Renting  SAKA  myspace  Rent  CommercialKe  WALLA ESTATES  Propd  KODI COLLECTIVE	 BE FORWARD REAL ESTATE  MyDeSali  ELITE  PropertyGuide+  Dar+Property  PRIME LOCATION HOME OF PROPERTIES  TANZANIA REAL ESTATES	 LAMUDI  Real Estate Database  SPECTRUM REAL ESTATE SOLUTIONS  PENTAGON
Coworking or Flexible Space	 NOMAD Lounges  Workshop  gig+ coworking  THE VLAGE  THE LYCEUM  THE BRANDSPACE  SOLIAN  almasi  axtr8  WORKABLE  The Twig  ELEGANT  Kijiji  Loftai  PARK PLACE  NEXUS CO WORK  ascendas  workstyle  mintHUB  Crews  SOLIS  Regus  NAIROBI GARAGE  IKVCΔ  DVA DIGITAL VILLAGE AFRICA  *Hub_  AHANSA  Office Park	 safespace  @work  SEEDSPACE DAR ES SALAAM  Kili Hub  BUNTU HUB  hub255  ndotohub  inspire  Vintage  Regus  enzo	 outbox  hive DDLAB  THE PRICE PIONEERS  MAWAZO  DESIGN HUB KAMPALA  Regus  Tribe Kampala  the creative tribe  Ideas to life... The Innovation Village  ARCHES HOLDINGS LTD
Digital innovation	 ibuild  360 VIRTUAL REALITY		 LANSULT TECHNOLOGIES AFRICA
Data & Analytics	 HASSCONSULT REAL ESTATE  ESTATE CLOUD		 REDAH
Crowdfunding & Finance	 PRC  LAND LAYBY HOLDINGS KENYA LIMITED		 CONEX

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## Services and Software – 18 Players

Kenya	15
Tanzania	1
Uganda	2

This category is one which generally presents significant opportunities for innovation and therefore high levels of proptech activity in global markets. The category is led by Kenya where it is evident that the major commercial property management companies usually utilise property management software (PMS) that has been developed in-house, or developed by established real estate companies, such as Knight Frank’s Property Management Accounting Software (PMAS). In terms of the residential sector, property management is mostly done by individual owners/landlords. This represents a largely maturing real estate services industry with significant opportunity for innovation.

At the same time, we identified multi-faceted software companies in all three countries that include PMS in their suite of products. This represents yet another opportunity for PMS-focussed proptech startups to deliver new and innovative products that can compete with the current offerings in these tech-literate markets. Examples include Manyatta Rental Software of Digital Age Solutions in Kenya. However, this is not to be interpreted as a lack of innovation in the region. Another interesting example from Kenya is Kodisher who describe themselves as a property management software leader for property management clients in Eastern Africa. They offer property and facilities management software products which provide digital platforms. Besides online integration, the company has integrated their property management platform with M-Pesa, the most widely used mobile money platform in Kenya. This offers landlords and tenants a convenient and efficient way to receive and pay rent. Furthermore, as mentioned in the previous section, there are companies that incorporate a range of proptech products which cover more than one of the categories used in this research. Key examples include To Let Digital who provide online listing services, online PMS software and drone services, and Square Apple who provide online listing services as well as an online PMS solution and online tenant management system which are launching soon. Both companies are based in Kenya.

Activity is currently limited in Tanzania and Uganda, with one company identified in Tanzania (Power Computers) and two in Uganda (Gandapps and MIAH). Power Computers and Gandapps are general IT and software companies that service a wide range different industries, including PMS products for the real estate industry which indicates a demand for such. MIAH produces PMS specifically for student housing and also offers a listing platform. The fact that there is only one company focussing purely on PMS highlights an opportunity for proptech companies to enter this important area of real estate.

Overall, while some exciting proptech activity was identified, there is clear opportunity for new products in this category that deliver modern and innovative solutions in an area of real estate that is generally slow to evolve. Multi-faceted proptech providers are an encouraging sign which are likely to result in various positive knock-on effects within the proptech sector, such as increased exposure for proptech as a meaningful part of the real estate industry, skills development and inspiration for future startups as well as established companies to bring true innovation to the market.

### Sales and Letting – 25 players

Kenya	14
Tanzania	7
Uganda	4

This category is quite prevalent within global proptech as the traditional property search, viewing and transaction processes presented a clear need for improved efficiency, convenience and cost saving, for the both the service provider and consumer. Specifically, relatively low-tech online listing portals for sales or rentals are quite common and represent some of the first proptechs in the industry, before the word itself was coined. We include these platforms in order to give a more comprehensive view of activity, especially in emerging markets. The next step up in this category are online estate agents which digitise as much of the property buying or renting process as possible, although examples of such are not yet present in KTU. Generally speaking, most of these types of proptechs operate in the residential sector, such as Leadhome in South Africa which has achieved significant success in the market. As a side note, this does not necessarily mean the end of estate agents though, which is a common assumption<sup>xxxiv</sup>.

There are a healthy number of online listing platforms present in the KTU region, with Kenya having the largest number which are also the most functional of the three in terms of true online listing platforms. However, in Tanzania and Uganda a number of online classifieds platforms such as Zoom Tanzania<sup>xxxv</sup> and Kupertana<sup>xxxvi</sup> in Tanzania, and Hello Uganda and Kiira<sup>xxxvii</sup> in Uganda<sup>xxxviii</sup> have large property sections which seem to take a significant amount of market share. Connectivity issues, especially in rural areas, and a lack of effective marketing may be key reasons why property-focussed online listing platforms are not more prevalent. That said, the activity that is present indicates a generally positive attitude towards searching for goods and services online which highlights the opportunity for more property-focussed offerings in this category. In addition, the general level of tech-literacy in the region means that the market may be receptive to digital sales and letting services.

Overall, we believe that the region offers clear opportunities for new online listing platforms as well as growth for existing players, including opportunities to diversify their services. In line with this, we identified two new platforms called Zimba and Get-a-Plot in Uganda which are currently under development, although they were not included in the map as they are not yet live.

### Digital innovation – 3 Players

Kenya	2
Tanzania	0
Uganda	1

This is quite a broad category which is needed to account for a wide range of digital innovation that usually starts on a small scale in real estate markets. Examples include blockchain enabled deeds registries and transactions, and virtual and augmented reality products. At this stage, activity is limited in this category due to the level of general proptech maturity and the related lack of specialised skills and funding. However, there are encouraging signs for future development driven by the high levels of general tech innovation in the region and on the continent, as discussed earlier in the report.

A promising sign for general digitisation in the real estate sector is that both Tanzania and Uganda are undertaking significant efforts to improve their land administration capacity through digital land information and management systems. These efforts are largely led by French company IGN FI (GEOFIT Group) which is a global geographic information specialist whose work covers databases, geographic information systems (GIS), themed portals and land management information systems<sup>xxxix</sup>. Kenya began a similar process in 2010<sup>xi</sup> and can be argued to be the leader in this specific area of land management in the region. This is important in countries where land administration is often problematic and inspires low levels of public confidence.

Digital land administration capabilities therefore represent powerful infrastructure that has already made significant contributions to the improvement of service delivery across the land sector (Migereko, 2016)<sup>xii</sup>, and is likely to continue improving the way land and real estate markets operate through improving the availability of information, efficiency of transactions and transparency of tenure. The implementation of National Land Information Systems in Uganda and Tanzania has led to a number of key improvements in service delivery as highlighted below;

- Significant increase in the number of land transactions
- Decentralisation of the cadastral and registration services

- Securing of land records and maps
- Establishment of audit trails for land transactions
- Improvement in the quality of records and their management
- Instant retrieval of land-related information
- Improved service delivery and public confidence

Overall, this bodes well for the continued growth of this category and general proptech activity as new solutions and products will be required in response to these significant changes that affect various stages of the real estate value chain. Furthermore, such interventions create digital platforms and access to large amounts of data which are the lifeblood of most proptech activities. Regarding the real estate market itself, the benefits are extensive and likely to boost overall activity. While infrastructure such as this is not delivered overnight, it is clear that the impact will be positive and lasting. That being said, the companies that are present in this category do represent exciting innovation in their own right.

iBuild Global<sup>xiii</sup> in Kenya is a software-as-a-solution (SaaS)<sup>3</sup> platform that can be accessed via a mobile application which is localised by market to stimulate housing construction activity. The app helps improve efficiency and transparency of transactions, while also improving quality of construction through verification of skilled professionals and authenticated suppliers. Also in Kenya, 360 Virtual Reality provides VR services to a number of industries including real estate, while Lansault from Uganda aims to provide digitisation and technology transfer for the wider built environment, with a current project focussing on measuring air quality and collecting analytics by using sensors.

Current activity may be limited in this category, but it is clear that the development of significant digital infrastructure coupled with an active tech environment provide a supportive foundation for future growth.

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<sup>3</sup> A method of software delivery and licensing in which software is accessed online via a subscription, rather than bought and installed on individual computers

## Data and Analytics – 3 Players

Kenya	2
Tanzania	0
Uganda	1

This is a crucial category for African real estate markets and one with little activity currently. Data and analytics are crucial enablers of increased transparency, efficiency and innovation around key areas such as market analysis, transactions and risk assessment. All of these are lacking in various levels on the continent which restricts investment and development activity, both of which are key within any real estate market.

JLL's latest Global Real Estate Transparency Index for 2018 highlighted a key finding for Sub-Saharan Africa as 'limited progress' overall, but the progress that exists is '*led by greater data availability and improved transaction processes in regional hubs*'<sup>xliii</sup>. Out of a total of 100 countries, Uganda was ranked 84<sup>th</sup> followed by Tanzania at 90<sup>th</sup> which places both in the lowest category; 'Opaque'. Kenya fairs slightly better coming in at 53 which places it in the 'Semi-Transparent' category, while the most transparent real estate market in Africa is South Africa which sits in 21<sup>st</sup> place. In line with the levels of transparency in the subject countries, our research identified relevant activity in this category in the form of only three companies. Estate Cloud and Hass Consult in Kenya both offer real estate consultancy services and some data services, although not strictly involving digital innovation. Encouragingly, there is one player in Uganda called REDAH Informatics that provides real estate information management solutions based on a software-as-a-service model that includes vendor management, asset tracking, market analytics and risk profiling. No relevant activity was identified in Tanzania which indicates a less mature market for data and analytics services in the real estate sector.

Elsewhere on the continent there are more sophisticated real estate data and analytics providers, such as IPD MSCI in South Africa and Estate Intel in Nigeria. It is clear that much opportunity exists to expand offerings in this category within KTU, driven by both demand and sheer need as markets struggle to operate efficiently due to a lack of transparency and workable data within the real estate value chain.

## Crowdfunding and Finance – 2 Players

Kenya	2
Tanzania	0
Uganda	0

The activity in this category is very limited or non-existent at this stage, which corresponds with the findings from our proptech research in South Africa. The main reason for this is that the regulatory environments in these markets are still working to understand and accommodate such activity in their financial sectors. Without this important enabler any finance-related innovation is basically on hold. By way of example, A4 Architects in Kenya failed to launch a crowdfunding platform for real estate investment largely due to regulatory challenges. That said, we predict that this category has strong potential due to the high-level of fintech activity and success in East Africa (particularly in Kenya). This fintech activity has achieved significant success around mobile phone money services, with a crowning achievement in the form of M-Pesa. This prediction is evidenced by Land Layby<sup>xiv</sup> who are already offering innovative and pioneering solutions around property investment and land management. Their online platform enables property investment for diaspora communities and wider markets, as well as digital land administration solutions for public sector including deeds registry infrastructure. This Kenyan/Australian entity with global ambitions is focussed on global diaspora communities looking to invest in property or land, but is operating in numerous countries with key aims of banking the unbanked and driving financial inclusion in the real estate market.

Another exciting fintech-enabled offering is M-Ploti<sup>xiv</sup> by the Property Reality Company (PRC) which aims to provide affordable property solutions to Kenyans via mobile phone technology. The mobile phone platform has transformed the way people carry out business, make payments, consume media and communicate, with significant success and innovation with the platform evident in East Africa. In this light, PRC developed the concept of M-Ploti which effectively enables land buying via a mobile phone meaning that any Kenyan could purchase property with flexible payment terms using sms-based e-commerce technology. The sustainability of these business models remains to be proven, but the innovation that they are creating in property transactions and investment clearly indicates the potential of this category through the combination of fintech and proptech solutions.

Overall, we believe the activities of these companies represent wider opportunities in the KTU region, as well as the wider African continent where countries often have large diaspora populations and inefficient land registries coupled with limited access to property as an investment asset class.

## Coworking or Flexible Space – 49 Players

Kenya	28
Tanzania	11
Uganda	10

While many coworking providers do not strictly use a tech-enabled platform to deliver their service, they represent a key innovation within the office sector in terms of flexible space solutions and therefore an important measure of activity within a proptech ecosystem. This innovation is part of the global space-as-a-service trend first witnessed in the office sector with key players including WeWork<sup>xlvi</sup> and IWG<sup>xlvii</sup>. Effectively, this trend merges real estate letting and hospitality, replacing a simple white box space on a long lease with flexible use options within a fully-serviced office environment, often with a focus on community. The trend is now evident in other real estate sectors including residential (e.g. The Collective<sup>xlviii</sup>), logistics (e.g. Stowga<sup>xlix</sup>) and even in the specialised kitchen sector (e.g. Kitchen Share).

Knight Frank noted in their recent Africa Horizons report that the trend is evident on the continent and is being pushed to mature by key drivers including the need to have space that supports a rapid growth trajectory, enables scale up and scale down and, crucially, provides an instant operational solution. In the KTU region, we identified a healthy offering of coworking spaces across all three countries mostly made up independent providers and some corporate or national players. This correlates with high levels of general entrepreneurship and relatively active tech sectors across the region, which usually result in a large amount of independent workers, startups and smaller tech-focussed businesses which tend to favour flexible, collaborative and trendy workspace.

There were a number of coworking space that were not included in the final data set as they often had no website and seemed much less professional than most competitors. Importantly it was not possible to verify that the spaces were indeed operating. That said, they may likely offer a much needed entry-level product in some markets, although they will need to improve their offering in order to survive in this active area of the office market. Interestingly, we identified a co-living company operating in Kenya called The VLage<sup>ii</sup>. In a similar vein to coworking, co-living provides a fully-serviced and flexible living environment. Options usually range from simple en-suite rooms with shared kitchen and leisure amenities (e.g. libraries, games rooms) to private apartments, all with a wide range of on-demand services like concierge, cleaning, dry cleaning and food delivery. According to The VLage, they offer stays starting from one night to longer than one year. In this way they can compete with the hospitality sector, and the long and short-stay residential sector (including the likes of AirBnb). Due to the significant housing challenges in many African cities, co-living, or shared-living, could provide an innovative solution which can be targeted at a range of market segments in ways that are significantly more flexible than existing housing options.

This was the largest category of the report indicating a higher level of maturity than most other categories. This is most likely due to the less tech-intensive nature of flexible space and an obvious need in these markets. Kenya again leads in terms of activity in line with its larger economy and demand for work space, but both Tanzania and Uganda held their own with the gap in activity between them and Kenya being largely less than other categories.

## Conclusion

This research has shed a light on the largely unknown proptech activity taking place in East Africa, within the context of our focus region of Kenya, Tanzania and Uganda. The research shows that proptech is indeed evident in these real estate markets, although it tends to be concentrated by geography or proptech category. Across the KTU region we identified **51** companies demonstrating proptech characteristics and **49** coworking or flexible space providers.

Some key categories show zero or very limited activity indicating an opportunity for new products and services that have shown significant growth in other countries but seem to be largely untapped in the KTU region. This shows a lack of maturity insomuch as these largely more advanced aspects of proptech are yet to be adopted on a meaningful scale in the region. Overall activity is heavily weighted towards Kenya which is to be expected given its larger economy and high level of general innovation. However, promising proptech-focussed activity was identified in Tanzania and Uganda, albeit on a smaller scale, with the nature of the activity pointing towards a significant opportunity for the sector to grow in coming years. Added to this, political will from public sector to improve overall efficiency and transparency in the real estate sector through digital intervention is clearly evident. Current public sector-driven initiatives in the region include land information systems and the development of improved digitised public services.

There are also common impediments to the adoption of proptech which usually accompany the period before any new technology or business practices become mainstream. In an interview with proptech advocacy body [Proptech Uganda](#), their project lead identified the main reasons for the lag in proptech adoption in the greater East Africa region as resistance to change, cultural differences, lack of tech-related skills (particularly in the real estate industry) and the general mindset of academia and professional practice in the real estate industry which is yet to embrace innovation on a meaningful scale. Proptech Uganda also highlighted that existing start-up ecosystems in Uganda and East Africa as a whole generally revolve around agriculture, health and education in line with the objectives of the ruling governments and many development partners.

In summary, while some innovative activity was identified in the region, this was sporadic and varied significantly in terms of sophistication and success. This is due to the key challenges faced by the KTU proptech ecosystem which largely centre around its early stage of maturity and the related lack of specialised skills and funding, as well as a lack of buy in from real estate stakeholders and limited support from regulatory environments. Importantly, it needs to

be noted that these represent common challenges that would have been faced by many advanced proptech ecosystems during the early stages of their maturity. This is because they are an intrinsic part of attempting to innovate within an industry that often tends to operate in a very analogue way in an increasingly digital world.

Proptech in the KTU region is on the right path with a solid foundation made up of robust and growing tech ecosystems, growing real estate markets and the proven will of both government and business to drive innovation. Thus, it is very much a case of 'watch this space', and we recommend that it is watched rather closely as the proptech ecosystem in this dynamic region contains all the ingredients needed to advance very quickly.

## Glossary

- KTU – Kenya, Tanzania & Uganda in terms the focus area for this research
- PMS – Property Management Software
- LIS - Land Information System
- Real Estate & Property – these terms are interchangeable depending on the region and country of use
- ICT - information and communications technology
- Blockchain – an open and transparent digital ledger with various applications, such as deeds registries and title deeds. Access to edit the ledger is strictly limited to the parties involved, e.g. the buyer and seller of a house during a transaction
- Proptech – technology related to the real estate industry
- Fintech – technology related to the finance industry

## Contributors

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- Ronald Kaweesi – Project Lead, Proptech Uganda
- Jevans Otieno - Founder, Proptech Kenya

## Bibliography

- i <https://www.worldbank.org/en/news/press-release/2019/10/24/doing-business-2020-two-sub-saharan-african-countries-among-most-improved-in-ease-of-doing-business>
- ii <https://www.cretech.com/product/funding-snapshot-september-2019/>
- iii <https://www.techstars.com/proptech-program/>
- iv <https://foundersfund.com/>
- v <https://www.khoslaventures.com/>
- vi E.g. <https://www.statista.com/statistics/951857/global-proptech-investment-value/> & <https://www.unissu.com/proptech-resources/global-proptech-funding-2019>
- vii <https://content.knightfrank.com/research/1741/documents/en/africa-horizons-2019-6292.pdf>
- viii <https://www.mercatus.org/bridge/commentary/how-technology-affects-economic-growth>
- ix <https://www.mercatus.org/bridge/commentary/how-technology-affects-economic-growth>
- x International Monetary Fund, World Economic Outlook Database, Accessed December 2019 (<http://data.imf.org/?sk=388DFA60-1D26-4ADE-B505-A05A558D9A42>)
- xi <https://www.eac.int/>
- xii [https://www.knbs.or.ke/?page\\_id=1591](https://www.knbs.or.ke/?page_id=1591)
- xiii <https://www.nbs.go.tz/index.php/en/census-surveys/national-accounts-statistics/na-publications/484-highlights-for-the-third-quarter-gdp-2019>
- xiv <https://www.ubos.org/quarterly-gdp-for-the-fourth-q4-2018-19-released/>
- xv Leading examples of relevant media platforms - <https://www.africantechroundup.com/>; <https://disrupt-africa.com>; <https://www.techinafrica.com/>
- xvi [https://partechpartners.com/documents/6/2019.03.22\\_-\\_Africa\\_Tech\\_Startups\\_raises\\_1.163B\\_in\\_2018\\_Partech-Report\\_nQIOkE7.pdf](https://partechpartners.com/documents/6/2019.03.22_-_Africa_Tech_Startups_raises_1.163B_in_2018_Partech-Report_nQIOkE7.pdf)
- xvii 618 active tech hubs: The backbone of Africa's tech ecosystem, Dario Giuliani & Sam Ajadid, accessed October 2019 (<https://www.gsma.com/mobilefordevelopment/blog/618-active-tech-hubs-the-backbone-of-africas-tech-ecosystem/>)
- xviii <https://ventureburn.com/2018/09/kenya-tech-startup-ecosystem/>
- xix <https://www.dw.com/en/finding-digital-solutions-to-local-problems-kenyas-innovation-scene-is-no-one-hit-wonder/a-47119339-0>
- xx Global Innovation Index (GII) 2019, WIPO, accessed October 2019 ([https://www.wipo.int/global\\_innovation\\_index/en/2019/](https://www.wipo.int/global_innovation_index/en/2019/))
- xxi <https://qz.com/africa/1663602/how-many-tech-hubs-are-in-africa/>
- xxii <https://www.businesslive.co.za/fm/fm-fox/digital/2020-01-09-silicon-savannah-is-still-helping-to-set-pace-in-africa/>
- xxiii <https://digestafrica.com/most-funded-startups-kenya>
- xxiv <https://medium.com/@jumannerajabumtambalike/what-you-need-to-know-about-tanzania-innovation-ecosystem-why-we-are-the-fastest-12ebfc7c32ef>
- xxv <https://silicondar.org/>
- xxvi <https://www.theeastafrican.co.ke/business/Tanzania-silicon-dar-es-salaam-turning-city-into-smart-hub/2560-5206906-5a1652z/index.html>
- xxvii <http://www.intracen.org/news/ICT-helps-drive-Ugandas-growth-but-sector-faces-challenges-says-top-official/>
- xxviii [http://acia.ug/?page\\_id=583](http://acia.ug/?page_id=583)
- xxix <https://estateintel.com/insights/african-proptech-series-nigeria/>
- xxx <http://afres.org/>
- xxxi <https://www.sbs.ox.ac.uk/sites/default/files/2018-07/PropTech3.0.pdf>
- xxxii <https://www.forbes.com/sites/angelicakrystledonati/2019/10/03/whats-the-big-deal-with-jll-technologies/#7766723d3e5f>
- xxxiii <https://www.cbre.com/real-estate-services/directory/flexible-space-solutions>
- xxxiv <https://ventureburn.com/2019/04/leadhome-estate-agents-proptech/>
- xxxv <https://www.zoomtanzania.com/>
- xxxvi <https://kupatana.com/>
- xxxvii <https://www.kiira.co.ug/>
- xxxviii <http://hellouganda.com/>
- xxxix Uganda And Tanzania National Land Information Systems: Data Conversion And Integration, Aurélie Milledrogues, Mark Griffin, Patrick Stimpson, Alexius Santoni And Christopher Burke, accessed October 2019 ([https://www.conftool.com/landandpoverty2019/index.php/11-10-Stimpson-468\\_paper.pdf?page=downloadPaper&filename=11-10-Stimpson-468\\_paper.pdf&form\\_id=468&form\\_version=final](https://www.conftool.com/landandpoverty2019/index.php/11-10-Stimpson-468_paper.pdf?page=downloadPaper&filename=11-10-Stimpson-468_paper.pdf&form_id=468&form_version=final))
- xl [https://www.conftool.com/landandpoverty2017/index.php?page=downloadPaper&ismobile=true&filename=01-01-Ntonjira-419\\_paper.pdf&form\\_id=419&form\\_version=final](https://www.conftool.com/landandpoverty2017/index.php?page=downloadPaper&ismobile=true&filename=01-01-Ntonjira-419_paper.pdf&form_id=419&form_version=final)
- xli Migereko, Daudi (2016) How Uganda is addressing land issues in the country, Speech presented at the World Bank Round Table Conference on Land Policy Process in Africa on the topic, Good Land Governance: Lessons

from Uganda New Vision, 24th March 2019, accessed October 2019

([https://www.newvision.co.ug/new\\_vision/news/1420403/uganda-addressing-land-issues-country](https://www.newvision.co.ug/new_vision/news/1420403/uganda-addressing-land-issues-country))

xlii <https://www.ibuild.global/>

xliii <https://www.jll.co.uk/en/trends-and-insights/research/global-real-estate-transparency-index-2018#:~:targetText=The%202018%20Index%20covers%20100,of%20real%20estate%20market%20transparenc>  
y\_

xliiv [https://hrbe.io/images/WHITEPAPER\\_HRBE06022.PDF](https://hrbe.io/images/WHITEPAPER_HRBE06022.PDF)

xlv <https://www.prc.co.ke/m-ploti/>

xlvi <https://www.wework.com/en-ZA>

xlvii <https://www.iwgplc.com/>

xlviii <https://www.thecollective.com/>

xlix <https://www.stowga.com/>

i <https://www.kitchensharelh.com/>

ii <http://www.thevlage.com/index.php>