

FACTORS INFLUENCING MANAGEMENT OF TECH START-UPS IN NAIROBI

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ABSTRACT

Tech start-ups in Nairobi are organized into incubation centres where they commonly develop online service-based applications. Nairobi's ICT sector is familiar with the roles & functions of these incubators but little has been documented about how developers actually manage their ventures. The results of this study describe the influence of knowledge & skills, financial resources and regulatory environment on the managerial activities of tech start-ups in Nairobi. The findings indicate that knowledge & skills are imparted adequately; 58% of developers who receive training on entrepreneurship & business management are able to successfully apply their skills. There is an average 52% success rate in securing external finances for well-organized start-ups with written business plans and an effective business model, receiving equal interest and support from both formal & informal investors. Managerial activities and innovative capacities are also influenced by government regulation and the acquisition of Intellectual Property (IP) of which the latter set are closely associated. The methodology adopted was collection of primary data from developers at incubation centres, managing online service-based ventures less than two years old. The findings in this research tend to mitigate risk concerns that venture capitalists and other investors have when investing into these tech start-ups.

Keywords: Business Model; Financial Resources; IP

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INTRODUCTION

Tech start-ups in Nairobi are increasingly becoming vital economic engines as they continue to ease service delivery. The management of these start-ups has been shadowed under the functioning of incubation centres which have been responsible for providing developers with the necessary tools to convert their ideas into successful ventures. Nonetheless, tech start-ups are still susceptible to various factors that influence their managerial activities and affect the overall success of their ventures. This introduction describes how start-ups in Nairobi are organized, their acquisition & use of financial resources, their views of IP and its influence on the competitive front.

Organization of Tech Start-ups

In well developed markets, tech start-ups are commonly organized around research campuses that provide knowledge support subsequently becoming innovative hubs that interest formal and informal investors. Zhang (2003) discloses that the manner in which these tech start-ups are organized proves to increase their chances of success. Frontier markets support tech start-ups primarily through independent incubators, pooling resources and organizing training & mentoring sessions for their developers. Both types of incubators set up favourable environments that allow technologies to progress from the ideas stage to becoming genuine products. The key to effectiveness in these incubation centres is open innovation, the process of combining internal and external ideas, as well as internal and external paths to market and advancing the development of new technologies (Moraa, Understanding the Key Factors of the iHub Model, 2012). This organization imparts the skills required to drive innovation and improve awareness of legal and regulatory issues.

Acquiring Financial Resources

Zhang (2003) states that start-ups in well developed markets have improved access to capital, taking an average of 11.6 months to complete their first round of venture financing, a figure

that is 5 months faster than their national average. Investors in these markets are accustomed to specific criteria that guide the evaluation of investment proposals; the entrepreneur is usually at the centre of this decision making process. The most prevalent objective for venture capitalists and their fund managers seems to be the investors return which is closely related to the fund managers' own return (Müllender, 2011). Here venture capitalists tend to highlight the start-ups' business model, the actual value the venture creates, enabling investors to discern the financial resources they intend to deploy.

In frontier markets such as Kenya, commercial capital is comparatively costly and the economy is often short of it as it attempts to curb inflationary pressures. Investors from well developed markets then introduce discounted capital while subjecting local start-ups to international standards of selection criterion. Recent research by Memba, Gakure, & Karanja (2012) indicates that limited access to credit is a major constraint inhibiting the growth of start-ups. The issues and problems limiting the acquisition of financial resources include lack of tangible security coupled with unsupportive legal and regulatory framework that does not recognize innovative strategies for lending to these start-ups.

Intellectual Property

Government decides the level of innovation by stirring the development of specific products and imposing laws that prohibit certain actions as regulatory misconduct. Brownsword (2008) stated that if government policy intends on channelling innovative behaviour, it determines the desired conduct is best achieved by product design; that is only when start-ups might be co-opted into government's regulatory scheme. Perhaps the most important law governing the ICT sector is the Kenya Industrial Property Act, 2001 which relates to IP. The core functions of Kenya Industrial Property Institute, KIPi are to administer intellectual property rights, provide technological information to the public and promote ingenuity by providing training and awareness on IP. Acquiring a patent as a legal protection ensures that these tech start-ups have a soft landing because their venture builds on IP as competitive edge. The IP remains their sole property which protects their inventions from unwarranted competition. However, when it comes to software it is not the applications that are patentable but the algorithms, functions and methods embodied in the software product. Acquiring a patent for software can protect unique features of a certain program that cannot be protected under The Copyright Act, 2001.

LITERATURE REVIEW

Tech start-ups are still receiving increasing attention by both policy makers and researchers, as they represent a major source of innovation and remain an engine of economic growth (Potočnik, 2008; Platts & Lim, 2008; Reding, 2008). This review describes the effects of three independent variables influencing the management of tech start-ups in Nairobi. The discussed factors include the following: knowledge & skills, financial resources and IP.

Knowledge & Skills

There are two key dimensions of knowledge: tacit knowledge & explicit knowledge (Polanyi, 1966). Polanyi defines tacit knowledge as that which is hard to imitate, formalize or share because of their subjective nature involving personal experiences of the subject; explicit knowledge represents a codified knowledge that is easily learnt and transferrable in all forms of communication. Different groups within the organization possess different skill sets that enable that organization to enact their strategies (Lepak & Snell, 1999). Skills such as programming are more practical and are used together with knowledge of programming languages to master the field of study. These knowledge and skills are imparted through organized institutions that tailor programs that foster imparting this knowledge.

The manner in which knowledge and skills are imparted is closely related to how the ICT sector is structured and how the system drives innovation and economic growth. Research by (Gichamba & Lukandu, 2012) suggests an adoptable design model for developing m-agriculture applications that involve the participation of stakeholders sharing mobile platform that meets several needs. The research study shows how solutions can be created using mobile technology that will help in addressing some of the problems faced by farmers, an industry that comprises 75% of the labour force by occupation. Giovanni Dosi (1988) stated that innovation is primarily a process built on the activation of the specific internal capabilities, cumulative routines and implicit or tacit knowledge. Innovation thus requires a certain familiarity with need identification and the problem solving process, exploiting both tacit & explicit knowledge.

Through the interest of multiple parties, tech start-ups receive a lot of knowledge and skills support especially through corporates channelling influential support through university campuses and programs. Because many of these centres take advantage of corporate support, there is an acknowledged effort to shorten the distance between long-term academic research and short-term corporate interests (Verrill, 2009). The universities are thus structured in a way that research information is shared between several different projects that request it. The

system in itself allows researchers and developers to solve current and imminent problems using interdisciplinary research.

Some universities claim that they can offer access to specialist, in-house facilities/expertise for spin-offs, although this may not always occur in practice (Patton, Warren, & Bream, 2009). For their part, university technology incubators aim to support networking opportunities by bringing in venture-capital investors from the wider business community, by negotiating relationships between the university and local government, by fostering a business culture in the local area and offering legal and daily business assistance (Peng, 2006). As in many new technology-based ventures, the knowledge base underpinning the unique selling point of the start-up resides in the founders, possibly synonymous as developers. Independent start-ups whose founders possess unique skill sets that drive innovation and incorporate apt management skills experience faster growth and higher rates of success (Smallbone, Slonimski, & Pobol, 2008). Jones-Evans & Cooper (2006) describe research entrepreneurs as having a knowledge-oriented science and technology development background, having worked in higher education or in a non-commercial laboratory. They also have limited managerial experience, but may be experienced in the management of research programmes and possess good personnel management skills.

According to Lewis et al (2011), tech start-ups attached to universities have greater chances of success as there is research information easily and readily available to them to exploit in developing their applications. The developer is thus able to build and manage the venture based on solid research. Due to the differences in economic and social needs, universities in frontier markets still lack the capacity to engage in high-tech or extensive research which directly explores new methods.

Financial Resources

Innovative ideas hardly go unnoticed; particularly ideas that solve problems and create new opportunities. Their innovations receive a lot of attention from corporates and investors who seek to increase value by closing needs gaps. Ideas are only beneficial when they are able to create or increase value by simplifying processes & formulating new methods. Converting these ideas into successful ventures requires financial resources. Financial resources are central to a firm's business strategy and have important implications for firm behaviour (Sanyal & Mann, 2010). According to Müllender (2011) the selection criteria used by venture capitalists to evaluate new venture investment proposals often comprises factors that are

evaluated exclusive of the venture's characteristics such as geographic focus, investments stage and contribution to policy. The ventures themselves are then selected based on factors such as entrepreneurial personality, managerial experience, product/service characteristics, market quality and financial characteristics.

Typically, venture capitalists and angel investors provide these financial resources to developers' start-ups. Once financial resources come in play, the venture becomes even more structured as the business model plays a role in structuring management and increasing accountability. These accountability mechanisms are presented vis-à-vis finance where managerial experience & product/service characteristics are paramount.

Concerning management, this accountability mechanism enables the venture to secure a management team that assist the developer(s) to bring all their ideas onto the market. Like in all high value adding services businesses, the costs of qualified staff are by far the largest representing around 70%, a figure close to the IT services ratio: around 80% (Jardat, 2009). Small firms rely mainly on the CEO's individual knowledge for developing innovations. Recent work suggests that this approach is inefficient since it underutilizes other employees' knowledge (Klaas, Klimchak, Semadeni, & Holmes, 2010). Consultants and field experts solve many of the problems tech start-ups have, constantly researching on industry trends, analysing competition and giving the client intermittent advice, whether legal or managerial, in terms of IP and anti-competitive behaviour including benefits of mergers and acquisitions (Andries & Czarnitski, 2011). The availability of financial resources to acquire such services improves the start-ups ability to compete and remain relevant to the client and the market. The use of financial resources by management to increase efficiency of managerial activities through the acquisition of equipment that supports technological functions and automation of processes is also relevant to tech start-ups. The start-up needs to remain in touch with market needs and the technological space that encourages their innovations and assists in developing solutions for the client. Financial resources are also vital in acquiring managerial advice, advice from experts who understand the market and market forces. Financial resources are useful in perfecting an application already under development i.e. through evaluation to reduce/eliminate errors etc. (Wasserman, 2009).

With regards to the unique characteristics that gives these products/services competitive edge, the accountability mechanisms formed through management are linked to the equipment & software used to develop it. Müllender (2011) suggests that proprietary technology seems to

be very important to all VCs given that this can be the main source of competitive edge and can provide security against product imitations – especially in the beginning of a product’s life cycle. The product diversification degree may also result in improved innovation as companies see an increase in technological opportunity for innovation in their product market and processes (Garcia-Vega, 2006).

According to (Moraa, Murage, & Omenya, Intellectual Property in Technological Innovations, 2012) many start-ups in Nairobi feel that IP processes are actively being practiced in well developed countries, and hence many of the Western businesses have ended up being successful and acquiring huge financial opportunities. In 2007, Sinta: the Belarusian nano-diamond firm had obtained a number of patents, with about 20 more waiting approval. Whilst these Belarusian patents are of little value in protecting innovations because of the underdeveloped system of protection of IP in Belarus; the company also holds Russian patents, which offer more protection. However Sinta lacks sufficient funds to seek foreign patents, which is a constraint (Smallbone, Slonimski, & Pobol, 2008). Sinta is a demonstration of how financial resources are useful in the acquisition of key resources that create value for start-ups in frontier markets through patents. The entire process ultimately structures management due to production processes requiring a unique combination of skills and raw materials.

Financial resources are also derived from the value created by the start-ups’ business model, providing them with alternative revenue streams. The most important revenue stream lies with the competitive advantages that IP, patents & copyrights create which may also be viewed as financial tools. The Patent & License Exchange (pl-x) is an online market for IP which deploys the tools of disciplined financial markets to transform powerful legal instruments into liquid financial assets. Pl-x has a patent valuation system that allows negotiating parties to confirm that they are receiving fair market value for their assets. TRRU Metrics IP valuation calculator is a tool that uses market financial data and the Black–Scholes Options Pricing Formula for calculating the value of patents, helping companies verify that it had accurately negotiated a price that was consistent with the market value for its technology (Glasser & Kossovsky, 2001). With the rise in the value of IP and the need to develop new intangible asset monetization strategies, other companies are looking to take advantage of these online financial IP marketplaces. Owners of copyrighted applications have certain exclusive rights including the right to copy the app, create derivatives or modified versions of it, and distribute copies to the public by license or sale. However, counterfeiting

and piracy of desktop software still threatens to destroy start-ups' revenue streams, making them weary of developing on-the-shelf software and so opting for e-stores that sell digital technologies directly to consumers.

Intellectual Property & Government Regulation

Intellectual property and competition law are of necessity intimately related. The essential aim of intellectual property law is to reward innovation and creation through the granting of exclusive rights to utilize a new invention or new information (Ganslandt, 2008). IP provide competitive edge revealing what new methods and systems will be adjusted or set in place, as regulated by competition policy or antitrust policy. Dube (2008) suggests that this is why IP enhances dynamic competition, by encouraging investments into new technological processes and differentiated products. There is however the exception to innovations with combinations of IP held in a particular exclusive property right when coupled with market advantages and technical standards can support extensive monopoly positions that may be subject to anticompetitive behaviour. Ganslandt (2008), states that this problem is most evident in cases where the owner of a critical technology or component refuses to license it, demands exorbitant fees or imposes difficult conditions that can limit legitimate competition. Note that there is a difference between IP and patents; IP and antitrust laws are commonly bundled together whereas patents are more relevant to monopolistic tendencies. While the antitrust laws proscribe unreasonable restraints of competition, the patent laws reward the inventor with a temporary monopoly that insulates him from competitive exploitation of his patented work.

IP is thus acknowledged as a key factor by which tech start-ups establish a competitive business model thus influencing the structuring of management and affecting managerial activities. This is because the innovative methods and systems of the specific IP keep the start-up competitively abreast and technologically relevant to the market. In addition, the purpose of IP is to promote disclosure of information, which can be significant for competition in the long run (Gallini, 2002). According to (Ganslandt, 2008) the gains from disseminating information and knowledge, plus the use of technology permitted by licensing including other arrangements should, therefore, be balanced against the static, short-run costs that arise because the disclosed inventions are not freely available. Intellectual property remains an important way of rewarding the commercialization of innovation which underpins

growth and development; it is as such a key element of the system (UN System Task Team, 2010).

Some unique innovations are not easily categorized under any one specific regulatory law, such that they cannot be fully regulated. As much as it encourages innovative behaviour it also causes innovative risk, where end-users are open to exploitation without proper legal protection or full legal repercussions for the developer(s). This exposes a grey area in regulating businesses with unique IP whereby such agreements for start-ups to roll out their new innovations, may not be strictly enforced. Given that IP policies are context specific there is also a need to ensure that, for those countries that request it, appropriate technical assistance is available to make most effective use of the IP system, especially in order to be able to foster innovative competition & support national development goals (UN System Task Team, 2010). In the case of mobile money, the service has not qualified to be protected under any IP regime so far (Makin, 2009). It is therefore not regulated by any statute or system, not even the banking industry. There are various IP issues that have been raised by the existence and exploitation of this mobile technology system. Other than the technology not meeting full regulation, the innovator and companies that are implementing this method have not been able to protect it under any IP regime and therefore risk infringement on it. The fact that some technology does not meet full regulatory standards also allows higher levels of innovation and competition. M-PESA was launched under a special licence – rather, it was done primarily because the regulatory team felt that, although the technology is not a fully regulated financial institution, to behave like one is the only responsible approach (Makin, 2009). As much as this encourages higher levels of innovation such as say the derivative M-Shwari: a mobile lending system, there are always ethical implications that the law does not regulate.

METHODOLOGY

This study uses a descriptive research design. Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data collection (Glass & Hopkins, 1984). This design allows the research objectives to provide the basis for systematic description of research problems that are as factual and accurate as possible. The sampling design used is a non-probability based sampling method, more specifically judgment sampling, where selection will be done to conform to criteria relevant to the study. The research will primarily use this method because there are a limited number of people that

have expertise in the area being researched. Few business persons have studied how ICT developers manage their ventures and what influences them to behave in certain ways (Özcan, 2008). The population here is all the ICT developers based in Nairobi. The sample described is tech start-ups that are in the process of developing an online, service-based application; the start-up here is operating from an incubation centre and is less than two years old. The start-up may also be synonymous with the developer(s).

There are currently more than 200 active tech start-ups in Nairobi with Moraa (2012) stating at least 150 are based at the iHub. This study's scope uses a sample of 12 start-ups i.e. 6 from university incubators and 6 from independent incubators. Research done by (Moraa, Murage, & Omenya, Intellectual Property in Technological Innovations, 2012) used a sample of 15 start-ups from 2 incubators as sufficient to carry out their research. Based on the methodology of that research study, and factoring in the inclusion of 4 incubators gives this study 72% accuracy of results. This study collected primary quantitative data between February 2014 and March 2014; the data was collected using a self-administered questionnaire. Likert scale was used to rank the factors identified in the questionnaire in order of their importance. The weighted mean of each factor was calculated and the factors ranked from one with highest weighted mean to the lowest. Due to developers varying schedules, there were a limited number of developers immediately available and the study used the fill as I wait method as the questionnaires were also structured to be simple and comprehensive. All interviewees were duly asked for their consent to participate in the study. All attempts were made not to invade the developers' privacy and confidentiality. No coercion whatsoever was used to either make the respondents comply with the questionnaire process or provide any pre-conceived answers.

RESULTS

Knowledge and Skills

The organization of tech start-ups in Nairobi proves to be effective. The sample indicates 58% of developers have received training on entrepreneurship and business management and have been able to successfully apply the skills learnt. Out of these developers who have received training, only one start-up had not established a business model. Of the remaining 42% who have not received any training, 80% still have a written business plan and have established a business model. This indicates that knowledge and skills are imparted adequately in both types of incubators. All the developers indicated that they were strongly

committed to the start-up, citing that the industry requires more incentive for them to increase their level of commitment.

While more than half of developers are adequately trained to manage their ventures, 83% of developers cited they required personalized assistance on the business end of their venture asserting that not all start-ups require the same blanket support that is offered at incubation centres. The remaining statistic indicates that 8% were complacent with their level of business education and the other 8% being part of a well-rounded team. From the sample interviewed it was disclosed that the most common apps among all the incubators primarily serves the broader economic sector with the socio-economic sector and the corporate sector tying in second place. Two thirds of developers are officially involved in 1 app development initiative, with the remaining third equally split between 2 apps and more than two development initiatives.

All developers agreed that research is essential for innovation, implying that they understand their respective markets and strive to carve niche through competitive advantage. Research however, is still not readily available to start-ups say in a central digital repository that is accessible to developers who require it.

Financial Resources

Formal & informal investors are equally interested in financing tech start-ups with each representing 40% as sole sources of external finances; the remaining 20% of financing is derived from a mixture of both types of investors. Compared to the success rate of 25% in well developed markets (Gage, 2012), securing financial resources doesn't seem challenging for well-organized start-ups with a written business plan and an established business model as this 58% statistic have a 71% success rate of securing finances. However, the most common app type (economic) has a marginally lower success rate in receiving financing i.e. 33%, demonstrating that competition increases where more developers are involved. Factoring in this competition lowers the success rate to an average of 52%.

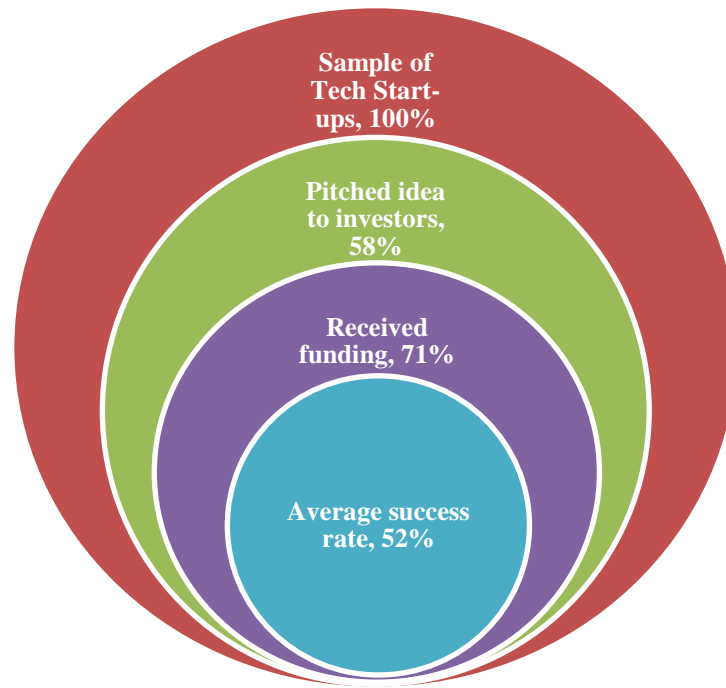


Figure 1: Success rates in securing financing

Using likert scale for analysing costs prioritization, 75% of developers indicate that they prioritize equipment & software costs to be very important demonstrating that developers are product-oriented. Start-up costs come second with 58% citing them as important as this legalises their venture and allows them to conduct business. Half of developers consider managerial costs to be more important than incubation costs with a third being neutral on the latter, conceivably as the principal resources at incubators are provided at no cost.

Business models tend to prioritize revenue streams according to the product or service that is being offered and which stream offers better value for the organization. With this regard, 36% of developers place IP, licensing, patents and copyrights as their most preferred revenue stream with two thirds of that statistic citing it as a very important revenue stream. 8% remains neutral on IP et al, involved in more than two development initiatives primarily developing apps for corporates and placing more importance on commissions/unit sales & system updates. IP as a revenue stream provides tech start-ups with competitive advantages utilizing these tools as solutions they can offer clients. The prioritization of this revenue stream sets precedent for emerging synergistic relationships to merge multiple technologies and enhance product value.

Advertising is second in preference at 26% with exactly half of that statistic citing it as very important. Commissions & systems updates are placed equal in preference at 23% each

having equal weights of importance even as they are both considered to be of last resort. Developers support this by stating the existence of a certain unwillingness of clients to pay for their service. With respect to commissions/unit sales, some applications also face piracy and counterfeiting if they were commercialised as physical units, making developers weary of developing shelf software.

Intellectual Property & Government Regulation

The study reveals that 92% of developers indicated they recognize their operating environment as adequately competitive with 64% of that statistic citing IP as the most important revenue stream. From the primary sample, the remaining 8% who didn't recognize their environment as competitive are neutral on IP as a prioritized source of revenue streams, the same statistic that develops apps for corporates. Within the scope of this study, there are four factors that influence the competitive atmosphere, they include: external financial resources, IP, market share for the service and innovative success. These four factors determine how developers behave in a competitive environment and how managerial activities are dependent on IP & government regulation that normalises competitive behaviour.

58% of developers who acknowledged their operating environment as competitive rank external financial resources as the most important factor influencing the competitive atmosphere. It received the highest percentage of factors ranked in 1st place, cited as very important. This leads developers to tailor solutions that are not only applicable in the domestic market but to the global market. Additionally, developers making profits in the industry are susceptible to divert their proceeds into other sectors of the economy which have higher returns, depriving the ICT sector of financing R&D. 25% of developers rank IP, copyrights & patents as the most important factor influencing the competitive atmosphere and the majority, 42% place it as a second priority. This statistic indicates that developers are inclined to develop unique innovations that are globally recognized due to the value IP potentially creates. The government becomes important with this respect as it is the legal custodian of filing for IP, patents & copyrights. The process is neither inexpensive nor easy, often being time-consuming as well. Although they are regarded as financial tools in the international paradigm, poor incentives keep developers from filing for IP which undervalues the export potential the industry presents.

Two thirds of developers rank market share for their service in third priority as a factor influencing the competitive atmosphere; no developer ranked it below 3rd place. 25% ranked it in 1st place, citing it as very important. The statistic indicates that the majority, 66.7% rank it 3rd place but not last, even though this ranking places it last. It is debatable whether this is an important factor or not but it remains safe to say that its importance is well prioritized by all developers. Stemming from this reasoning, we can also deduce that there is more competition for market share since the majority of developers understand exactly its level of importance. 58% of developers rank innovative success as the least important factor influencing the competitive atmosphere as even no developer ranked it in 1st place. Weighted against the statistic of IP et al influencing the competitive atmosphere, this is a psychological indication that developers are inclined to boost competition by creating value rather than compete self-interestedly to satisfy psychological needs.

CONCLUSIONS

The disclosure of the influence of knowledge and skills on managerial activities of developers & tech start-ups is evident in this study. Knowledge and skills remain essential for any field of expertise dictating how experts respond to core issues in their industry. The organization of the ICT sector is embedded with explicit training that supports the industry, tailoring academic programs that develop innovative solutions as required by the sector. Research remains essential as it documents findings that promote interdisciplinary research, a facet that is still largely uncharted.

Tech start-ups are highly conversant with creating value for client organizations, allowing the relatively higher success rate in financing to be as a result of sound business models. All means of acquiring financial resources requires that the applicant be scrutinised under predetermined criteria. The criterion requires the applicant to have some form of accountability, which in this case are the management structure and the business model. From a financial standpoint and with respect to risk & accountability, it also becomes important to understand the overall profitability of the sector both for the developers & the economy. IP, copyrights & patents as a financial tool is still underutilized even though 36% of developers rank it as a potential source of revenue, the highest percentage of any revenue stream.

Going forward, the ICT sector is increasingly reliant on IP & the effectiveness of its regulatory environment. Just as this sector is novel, so are a majority of its developers, the founding members of Nairobi's ICT sector. As much as the atmosphere is regarded as

competitive, this novelty lacks proper incentive that fosters varying levels of competition giving developers the ability to compete globally. Of particular interest is the persuasive angle on how government can support the sector without increasing control, giving tech developers incentive to develop globally competitive IP, patents & copyrights that keep the Silicon Savannah on the map. With regards to the competition IP generates, there is always the perception of quality over quantity, where the former makes competition more potent to the extent of creating temporary monopolies that are seemingly be cyclic as developers continue to match and surpass each other's innovations.

RECCOMENDATIONS

The organization of tech start-ups in Nairobi imparts knowledge and skills adequately; perhaps focus should be placed on increasing the volume and depth to which these skills are imparted. To remain innovative and regionally relevant, developers in the ICT sector require an increase in the depth of research, focussing on technologies that are detail & hardware oriented or biologically innovative. This requires interdisciplinary research labs that admit several different ideas from different incubators, research centres, corporations, university campuses, government departments & other organizations. These new types of labs increase the commercial value of the sector and potentially reorganize it to say exclude the C from ICT, a step towards technological depth. This potentially results in an influx of foreign capital & skills and a transformation in the education system (as also suggested by developers) to foster an entrepreneurial and innovative environment for future generations.

The ability of financial resources to influence managerial activities by establishing business models is obviously evident. Recommendations for this independent variable would focus on increasing accountability to enable the developer to have access to more financial resources. The sensitive nature of financial recommendations should be thoroughly expounded, even as that remains beyond the scope of studying the influence of this independent variable. The ICT sector requires continuous assessment mechanisms that monitor investments into the sector, how these finances are utilized by developers, avenues by which the developers create value, how much value the sector generates and how much is re-invested. This proposed mechanism is comprehensive, encapsulating aspects of the study within it and broadening the spectrum of the scope. This recommendation suggests that an accountability mechanism is not only important to the developers' start-ups but to the sector as a whole as it too would reduce the risk of investing into the novel sector and encourage IP to be assessed as financial

tools and perhaps even held as collateral by local lending institutions. This requires that developers become conversant with accounting & investments or possibly source personalized assistance from experts to aid them managing their growing business. With respect to how developers intend to create more value for themselves, perhaps the solution lies with another developer, developing a domestic app search portal where users can purchase & use any app. The portal may also simply inform on developed apps for sale & advertise developers' services. Such portals would need to be online and constantly updated, drawing little or no revenue as they are part of a support system.

An environment that encourages innovative competition should have more supporting mechanisms & fewer systems of control. Support mechanisms usually come from within a system that prevents it from collapsing, such as say a developers association that lobbies the interests of members of the group. The strength of such independent groups to liaise with government and organize international conferences that foster the sharing of information & experiences would be of great benefit. Developers/Scientists would also be able to identify interests collectively and pressure government to consider their interests including improving the quality of the technological environment to match international standards especially at these proposed international conferences. Government regulation should also encourage higher levels of innovation to develop globally competitive products by safeguarding proprietary information. Perhaps this should also be done by giving developers incentive that motivates them psychologically, seeing as novel sectors generate marginally smaller shares in revenue. Incentives such as tax breaks increase their profitability, and by supporting their IP, copyrights & patents as financial tools sends a strong signal to investors. To attract developers into Nairobi, government should also shorten procedures of starting a technology based venture, complete with easily filing and enforcing patents and other proprietary information.

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