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Innovation through accelerators: A case for open innovation

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Background: Open innovation is becoming a progressive business practice in Southern Africa because it plays a significant role in economic development through promoting the commercialisation of new ideas. The challenge is that while the benefits of open innovation are widely spoken about, not much is understood about the challenges and successes of open innovation accelerators (OIAs) in taking ideas to market.

Aim: The purpose of this research was to investigate an OIA in South Africa for taking ideas to market.

Setting: The Innovation Hub is a science park in Pretoria, South Africa, using open innovation to stimulate entrepreneurship in South Africa. Through The Innovation Hub Open IX, a web-based platform, an opportunity to investigate the bridging from invention to commercialisation is presented.

Methods: A qualitative research method using semi-structured, in-depth interviews was applied to collect data. Five key stakeholders of the OIA were interviewed.

Results: The findings suggest that stakeholder buy-in is essential for commercialisation through OIAs in South Africa. By involving stakeholders in the initial phases of the open innovation process, the likelihood of a solution being incorporated and fitted into the organisation's business strategy is increased.

Conclusion: The insight gained from this research suggests policymakers, research institutions and commercial businesses ought to explore various innovations across industries relevant to their open innovation proficiencies. This research makes a significant contribution to an in-depth understanding of what is needed to bridge the gap from invention to successful commercialisation through open innovation.

Introduction

In today's globally competitive environment, innovation has become the key measure of a business's sustainability (Manceau *et al*. 2011:4). Businesses are required to increasingly innovate in order to obtain a competitive advantage. In turn, government, universities, research institutions and even individuals have become attracted to forming industry partnerships in the hope of monetising their research (Huston & Sakkab 2006:2).

This implies that businesses and various role-players have become less confidential with their innovation practices and have leaned towards the idea of leveraging each other's innovation assets. This form of mass collaboration has brought about open innovation (Chesbrough 2003:5). This implies the use of purposive inflows and outflows of knowledge to accelerate internal innovation and to expand the markets for external use of innovation, respectively (Park & Yoon 2013:206).

Businesses in Southern Africa, regardless of their industry, are starting to implement open innovation in order to maintain their competitive advantage, maintain more effective product development management and essentially to meet consumer needs (Shurrab & El Bouassami 2013). Open innovation plays a significant role in the economy, as it stimulates total early-stage entrepreneurial activity (TEA) through the commercialisation of ideas (Iakovleva 2013:18).

South Africa is a middle-income country with relatively low GDP per capita income (Dutta & Lanvin 2013:307). In an effort to raise this GDP per capita income, the government has turned towards entrepreneurship and small and medium-sized enterprise (SME) development. There have been a number of initiatives and incentives that aim to achieve this. However, South Africa

has shown very little early-stage entrepreneurial activity with a mere 9.2% TEA rate in 2015, which is still far below the 15% average for efficiency-driven economies – 1.6 times higher than South Africa's TEA rate (Herrington & Kew 2016:28). The low level of early-stage entrepreneurial activity in South Africa limits economic growth and job creation in the country.

One of the reasons for the low entrepreneurial activity is that, while there have been policy pronouncements at a macro-level, there has been very little follow-up at the meso-level, as well as disinterest from the micro-level (Bodhanya 2008:7). The meso-level is made up of government and private agencies, as well as intermediaries who serve to translate government policy into tangible benefits for the micro-level, i.e. entrepreneurs and SMMEs. Contributors in the meso-level include science parks and incubators. While most of these meso-players have concentrated on traditional incubation services, there has been a recent interest in using innovative approaches, such as open innovation, to stimulate entrepreneurship (Cunningham, Cunningham & Ekenberg 2016:2).

The Innovation Hub is a science park in Pretoria, South Africa. It uses open innovation as one of the methods to implement the Gauteng Innovation and Knowledge Economy Strategy (GIKES). One of the aims of this strategy is to stimulate innovation and successful commercialisation. The Innovation Hub Open Innovation Solution Exchange (referred to as Open IX), a web-based platform, presents an opportunity to investigate the bridging or crossing of the chasm from invention to commercialisation (Anon 2016).

Problem statement

Although the benefits of open innovation are widely spoken of, very little is known about the open innovation intermediaries that help entrepreneurs in commercialising their ideas. Investigating the people, products and challenges of the platform can lead to an in-depth understanding of what is needed to bridge the gap from invention or idea to market or successful commercialisation.

The purpose of this paper is to investigate an open innovation platform for taking ideas to market.

To achieve the purpose of this paper, the following objectives were formulated:

- To discuss the open innovation platform that is used in Southern Africa to foster commercialisation.
- To understand the challenges faced by the key stakeholders of the open innovation platform.
- To recommend what is needed for the success of the open innovation platform.

The research will assist policy-makers in making better decisions about what is needed to improve success in taking ideas to market and in essence promote TEA. This research will also assist inventors to make better decisions in taking their ideas to the market by enabling them to better understand the intricacies and complexities of what is required to successfully take an idea to market.

Literature background

The open innovation process

Traditionally, businesses develop their technology and products internally, resulting in innovation relying solely on internal resources, according to Mortara *et al*. (2009:12). Open innovation eradicates these boundaries and allows businesses to share and corporate resources with partner organisations and internal business units. Open innovation suggests that a business should not confine its discovered knowledge to its internal market mediums alone, nor should internal pathways necessarily be limited to bringing only the business' internal knowledge to market (Chesbrough 2003). According to Bogers *et al*. (2016:3), open innovation is concluded as a distributed innovation process based on purposively managed knowledge flows across organisational boundaries. It is a form of mass collaboration used to connect the various role-players within government, industry and academia in order to leverage their innovation capabilities (Piller & Diener 2013:6). The relationship between university, industry and government is referred to as the triple-helix model. It is, in essence, the crossing over of businesses, public research and government regulations. (Leydesdorff 2006:3).

Open Innovation entails three core processes: outside-in, inside-out and coupled processes. Not all businesses select the same core process, as each business chooses a core process that best suits its strategic objectives (Gassmann & Enkel 2004:60).

Outside-in open innovation process

Outside-in open innovation, as a core process, involves collaborating with suppliers and customers and integrating any external knowledge gained (Chesbrough & Crowther 2006:229). In an attempt to increase innovation capacity, businesses develop and augment their own knowledge base through integrating suppliers, customers and external knowledge sources (Gassmann & Enkel 2004:7). Businesses screen the industry in order to in-source technology and knowledge over and above their own research and development (R&D) (Spithoven, Clarysse & Knockaert 2009:2). Outside-in activities include in-licensing and buying of patents, earlier supplier integration, customer co-development and external knowledge integration (Bianchi *et al*. 2011). By possessing the necessary competence and supplier management capabilities, businesses can extend new product development activities across organisational boundaries (Fritsch & Lukas 2001:302).

Inside-out open innovation process

Inside-out open innovation, as a core process, involves externalising the business' innovation and knowledge in order to commercialise ideas more rapidly than the business

is able to do through internal development (Gassmann & Enkel 2004:10). It depicts the outward transfer of technology in open utilisation processes (Lichtenthaler 2009:318). This situation can arise, for instance, when the business does not have the ability to realise sufficient revenue in its own market or when the technology is a spin-off, which cannot be used for the core business (von Nell & Lichtenthaler 2011:133).

With inside-out processes, businesses gain insights by means of opening their boundaries and increasing their advantage by allowing ideas to flow outwards; as a result, fixed costs of R&D are decreased and risks are shared (Gassmann & Enkel 2004:11).

Coupled open innovation process

The coupled open innovation process integrates both inside-out and outside-in processes, thereby not only bringing in external knowledge but also bringing ideas to various markets (Gassmann & Enkel 2004:12). Companies that establish the coupled process co-create with corresponding partners through joint ventures, alliances and cooperation and in doing so, jointly develop and commercialise innovation (Enkel, Gassmann & Chesbrough 2009:311).

Challenges faced in implementing open innovation

Open innovation has a realistic influence on a business's innovation strategy and performance and may pose challenges that a business may incur when adopting an open innovation process. The most complex dilemma facing businesses that institute open innovation programmes is the prospect of revealing a business' intellectual property (IP) (von Dyck 2015). A business revealing its IP by disclosing ideas or inviting other businesses into its innovation process is often seen as a weakness (Gaskell 2013). Furthermore, Marais and Schutte (2010:106) suggest that with open innovation, the possible decrease of a business' competitive advantage could result in future planned products or services being blemished. Although setting legal agreements involves complex administrative procedures, managing and regulating IP rights effectively can yield optimal outcomes for both innovators and society at large (Fisher & Oberholzer-Gee 2013:174). As IP rights are prioritised, an increased protection of new innovations in South Africa will result.

Collaborative relationships are at the core of open innovation (Slowinski & Sagal 2010:38). However, encouraging parties within the business to commit is an unstated challenge. According to von Dyck (2015), without an internal structure in place, no systematised mechanism for accepting and implementing solicited and/or unsolicited submissions exists. This, in turn, affects the monitoring of the programme and benchmarking of performance. Businesses often assume that the source of the innovation, in some cases the open innovation accelerator (OIA), will continue with the production and implementation of the innovation within the business (West & Gallagher 2006:323). This free-riding behaviour and lack of internal commitment hinder the success of open innovation. Additionally, the cognitive, cultural, institutional and organisational differences between the collaborating businesses as well as the lack of resources and skills needed to understand and combine the new innovation with the business' internal innovation pose a challenge, influencing collaboration (van de Vrande *et al*. 2009:427).

The challenges to successful open innovation lie in its involvement in a business' key functions right through the innovation process (Anon 2009:1). Open innovation is characterised by its participation in the different stages of the innovation process and not just R&D (Mortara *et al*. 2009:12). While businesses have their own innovation process and R&D departments, they are still inadequate and have limited experience on how to successfully manage open innovation activities. This is because acquiring external ideas and sharing internal IP do not epitomise the core strategy of most businesses (Lichtenthaler & Ernst 2008).

In an effort to overcome the challenges experienced with open innovation, businesses often depend on the support from intermediary services (Nambisan & Sawhney 2007). Intermediaries play a major role in the open innovation procedures and are involved in an estimated 20% of all technology transactions. Very little is known about the intermediaries using open innovation to aid in accelerating ideas to the market and/or businesses in commercialising their ideas. These intermediaries are known as OIAs (Piller & Diener 2013). An OIA, as defined by Howells (2006:720), is an organisation or body acting as an agent or broker in any facet of the innovation process. These service providers support businesses in executing open innovation projects and can be from the private or public sectors. OIAs either run the open innovation project on behalf of their clients (thereby providing a solution to a given task) or aid their clients in building their own open innovation proficiencies (Piller & Diener 2013:4).

An open innovation accelerator in South Africa

The Innovation Hub, located in the capital of South Africa, Pretoria, has piloted one of Africa's first OIA s: The Innovation Hub Open Innovation Solution Exchange (now referred to as OpenIX). The OpenIX is a web-based innovation network, which connects experts from various businesses, research scientists, SMMEs and government to relevant R&D problems across Gauteng. Businesses or governmental entities with a particular business need, which could not be solved internally, post these needs, referred to as challenges, on the platform. Researchers, innovators, entrepreneurs, SMMEs and larger businesses are invited to respond to these challenges posted on the platform, by submitting potential solutions. These experts are referred to as solution providers or solvers, while businesses posting the challenges are referred to as solution seekers (The Innovation Hub 2013:6).

The methodology of the OpenIX was built upon Ninesigma's open innovation process (The Innovation Hub 2013).

It is referred to as the 'C4' methodology. This methodology takes place in four phases, namely challenge definition, connect, consider and commit. Challenge definition involves identifying a list of needs within the business and structuring the needs in such a way that it creates a position for specific challenges. Huston and Sakkab (2006:3) argue that, during this phase, it is imperative that the OIA ask the business who is seeking a solution what previously undefined needs the consumer may have. In doing so, the business could possibly increase their product and brand growth. This is needed because often their researchers work on problems that are of interest to them, rather than those that stem from deep consumer insight, thereby leading to increased brand growth (Khan 2015).

The connect phase involves promoting the challenge by stimulating the local innovation ecosystem. By marketing the challenge and networking, solution seekers are connected to a variety of external possible solution providers who are often new and unknown to the seeker (Piller & Diener 2013:5).

During the consider phase, the proposed solutions are evaluated, shortlisted and feedback is provided to the selected solution providers. Huston and Sakkab (2006:6) further stress that solutions should be screened through due diligence, information gathering, sampling and testing, scanning patents and meeting with laboratory managers, among others.

For The Innovation Hub Open Innovation Exchange, evaluation is done by following a dashboard approach, testing what has been delivered alongside the defined need. This involves meeting with solution providers, final shortlisting and providing feedback to the selected few (Anon 2016). Upon shortlistings and feedback from both solution seekers and providers, a commitment by the solution seeker has to be made. This takes place during the commit phase, the last phase of the C4 methodology (The Innovation Hub 2013:8). The commit phase is a confidential process between the solution seeker and the solution provider, unless the OIA is required to facilitate this process. The objective of this phase is to reach some form of agreement where a deal is made.

It is clear that, although the platform is web-based, the majority of the tasks related to connecting the seeker with the solver are done by the OIA, namely The Innovation Hub project team. This hand-driven process is vital in assuring that the right solutions are found for the challenges. The project team has to ensure that challenges are defined to their lowest level, because the challenges are campaigned to various stakeholders within the triple-helix. The word campaigning is frequently used in the innovation setting. The project team also ensures that the challenges are distributed across various media platforms, which include telephone calls, e-mailing and advertising to the relevant stakeholders. The evaluation and commitment to solutions are a collaborative effort carried out by the expert facilitators in the project team as well as the solution seeker's team (The Innovation Hub 2013:4).

Research methodology

A post-positivism world view was used as it reflects the need to identify and assess the causes that influence outcomes. The knowledge developed through a post-positivist lens is based on careful measurement of the objective reality that exists (Creswell 2009:7). The research involved a qualitative approach allowing for data to be collected in the format of semi-structured interviews. Interviews were conducted on a one-on-one basis allowing open-ended questions to be asked (Bradley 2010:234). Asking open-ended questions helped in obtaining an understanding of the cognitive and interpretive processes of key stakeholders of the open innovation platform by learning of their judgements about the experience and issues on the platform and factual information regarding the open innovation platform, i.e., how the platform had been run and what challenges and opportunities had been presented, as well as potential commercialisation opportunities, partnerships and further developments.

Sample profile

Nine participants were identified and approached for interviews, of whom five participants agreed to be interviewed. These participants represented the core project team of the open innovation platform. The participants were involved in both the design and management of the open innovation platform in addition to having extensive knowledge on supporting mechanisms for taking ideas to the market through the use of open innovation. Participants had an in-depth understanding of open innovation within the South African context, the open innovation platform and the components needed in accelerating ideas (solutions posted onto the platform) into commercialised entities.

Data analysis process

All semi-structured interviews were recorded and transcribed for analysis. When analysing the qualitative component of this research, a content analysis method was utilised. Content analysis entails systematically categorising responses with the aim to identify overall trends and patterns (Vaismoradi, Turunen & Bondas 2013:400). The aim of content analysis is to obtain a condensed and broad description of the phenomenon, and the outcome of the analysis is concepts or

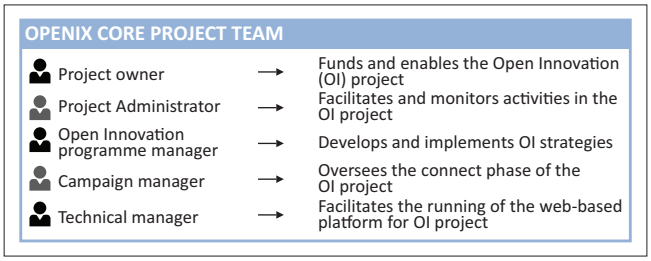

FIGURE 1: List of participants and their responsibilities.

categories that describe the phenomenon (Elo & Kyngäs 2008:108). Therefore, content analysis served to determine the characteristics of the transcribed interviews' content by examining who says what, to whom and with what effect (Bloor & Wood 2006:58).

Consequently, the data underwent a content analysis process that concerned deriving categories from the qualitative data. The data generated through these qualitative interviews were synthesised into three major themes, i.e. OIA, commercialisation and open innovation.

Reliability and validity

Two issues contributed to the reliability of the qualitative data, namely its dependability and its confirmability (Miles, Huberman & Saldana 2014:312). Bias and deceit were avoided because the transcription of the interviews was done by an expert in the specific field of research and also evaluated by the researcher to ensure accuracy. To confirm the originality of the qualitative results, direct quotations were used from the discussions so that recurring themes from different interviews could be seen. The researcher also acknowledged any limitations of the investigation and the potential effects thereof (Shenton 2004:73). Transferability measures to what extent the results or findings are relevant to a wider population or a different case (Matthews & Ross 2010:12). The data obtained from the interviews provided detailed information regarding the open innovation platform. Therefore, the information provided cannot be applied to different cases, but could serve as a guideline for such cases.

The limitation of this research: This research only focused on using an open innovation platform as a method of accelerating commercialisation. Other approaches to accelerating commercialisation were not investigated. Because of time and financial constraints, the research was only conducted on one open innovation intermediary in Southern Africa. Other open innovation intermediaries within the Southern African Development Community region were excluded.

Ethical consideration

Completed in accordance to the NWU ethic guidelines.

Results

The five interviewees, who are stakeholders of the open innovation platform, were asked questions that provided them the opportunity to discuss factual information regarding the platform (objective 1), to share their experiences regarding how the platform had been run and to indicate any challenges (objective 2) and opportunities that had been presented through the platform (objective 3).

Understanding the open innovation accelerator

Participants' feedback regarding OpenIX provided detailed insight into the platform thus far. The insight provided by the participants emerged into four themes, namely, challenge definition, evaluating solutions, marketing and deal-making (Table 1).

According to these participants, the OIA ensures that a business clearly defines its needs in a manner that ensures the transferability of the needs across domains outside the business' own. The procurement team, open innovation experts, technical experts and other parties play a role in the transferability of the challenge and plan accordingly during the kick-off meeting. Through the kick-off meeting, an increase in the possibility of absorbing the new solution into the business ensured. Participants added that the economic and technical feasibility of a solution is always evaluated, while considering the costs and legalities around the solution and the relationship the challenge owner is looking for.

TABLE 1: Direct quotations of responses regarding the open innovation accelerator.

Objective 1	Theme components	Description (*verbatim quotes*)
Open innovation accelerator	Challenge definition	'A challenge is a real business need'; 'We narrow down the issue [need] by prioritising a challenge with a client'; 'We will rank and prioritize them [the needs],and see where the business wants a solution as a matter of urgency'; 'Choose one would be the most suitable for open innovation … then presenting it in a way that is transferable across different domains outside of the core domain'; 'If we don't define also the human process then the chances of absorption of the technology to be found gets less'; 'The business development manager and our Open Innovation expert sit with a team from the specific organisation'; 'It's important to look at whether there is budget to solve and to pay for the implementation of the proposed solution'.
	Evaluating solutions	'They need solutions to address their operational problems, or technical problems'; 'We are looking for solutions that are feasible both economically and technically'; 'What are the technical elements that are of interest to the client? The solution will work at a certain cost point... and it must be legal'; 'We have some standard evaluation criteria'; 'The challenge brief will outline the specifications for a solution'; 'there will be specific criteria that every solution has to meet'.
	Marketing	'We have various networks at universities, relationships that we build'; 'We send it [the challenge brief] to their databases'; 'The campaigning team phones these companies and ask them to submit proposals to challenges'; 'We specifically, actively look for people who can potentially solve the challenge'; 'We read on the websites to then make a decision if we're going to email them the challenge or not'.; '…it relies on the campaign people to see where opportunities lie'; 'We use bulk email, we use personal emails, telephone calls, newsletters, Open Innovation workshops'; 'We invite people to attend the workshop, then we explain the challenge, they see an opportunity then they will respond'; 'We also do our own Google searches and we make use of LinkedIn'; 'It is quite a human driven process'; 'We send it [challenge brief] out in a newsletter and send it out on the website, then wait for responses'; 'The innovation network receives notification of the challenge but it is part of the innovation news'; 'They can visit the website to see the challenge'.
	Deal-making	'There's quite a specific boundary'; 'we go up to a point … and up to where the agreements are made between the solution provider and the solution seeker'; 'the initial engagement, we do one engagement between the challenge owner and the solution providers and then we hand over to the client normally'; 'we arrange the meetings, we arrange the shortlist presentations'; 'make sure that they sign the necessary agreements'; 'We protect them [solution providers] and make sure that they sign the necessary agreements'; '…whatever we give the challenge owner is credible enough, it's got a fit for purpose and there's enough interest take it forward'; 'We try to align the solutions to the criteria set during the challenge definition kick-off meeting'.

The stakeholders further explained that the OIA facilitates communication between challenge owners and solution providers when making a deal. This is done by arranging meetings, shortlisting presentations and advising the SMMEs regarding IP. The solution providers who are shortlisted sign a non-disclosure agreement (NDA). Signing the NDA, according to the participants, ensures that solutions submitted are not published, except between the solution seeker and the provider.

To accelerate taking ideas to market, participants explained that the OIA uses various networks and industry associations to market the challenges to potential solution providers. Marketing the challenges requires from the campaigning team to identify opportunities in the different sectors. This is accomplished by pro-actively identifying emails and telephone numbers of potential solution providers and inviting them to take part in the challenge. The participants then run challenge workshops not only to create awareness of open innovation in Southern Africa but also to provide detailed information regarding each challenge. The OIA's database is used and grown as each challenge is marketed. Apart from this hand-driven process, participants added that challenges are posted onto the website and on newsletters in the hope that potential solution providers will log in and respond to the challenge. Table 1 reflects the direct quotations of participants regarding understanding the OIA.

Challenges faced by stakeholders: Intellectual property protection and collaborative partnerships

Three main themes, namely IP protection, collaboration and triple-helix, were identified from the participants' description of their experiences regarding how the platform had been run and the challenges they face when operating such a platform. The direct quotations regarding these themes are reflected in Table 2.

IP protection should play a vital role in accelerating commercialisation through OIAs in South Africa. The importance of protecting the IP of possible solutions when dealing with OIAs was emphasised by the stakeholders. According to the participants, the OIA plays an advisory role when dealing with the protection of IP. Participants stated that OIA prevents the leakage of IP by advising the solution providers on what content they should and should not provide. This means that the OIA facilitates communication between the solution provider and solution seeker until a NDA is signed; thereafter, the deal-making becomes a negotiation between the solution seeker and the solution provider. Apart from authenticating the potential solution providers' credibility by verifying their backgrounds and facts and the reputations of the key contributors involved and investigating the technical competencies of the possible solution, participants added that a more rigorous approach to protecting IP is necessary.

Open innovation, in its core, is based on collaborative relationships (Slowinski & Sagal 2010:38). Businesses often assume that the source of the external innovation (the solution provider) will continue with its production within the business (West & Gallagher 2006:323). However, this is often not the case. Participants detailed that obtaining buy-in from stakeholders within the business of the solution seeker was an unstated challenge. Participants emphasised that it is difficult to monitor collaboration through technology offers. Participants explained that technology offers are a good entry point into various organisations, and therefore broadening partnerships; however, facilitating these technologies has been a passive process as it is relatively under resourced and therefore difficult to monitor. Using the website and sending out occasional newsletters regarding technology offers are done, but is not an effective way of promoting and monitoring collaboration.

Furthermore, the participants emphasised the importance of the involvement of the triple-helix when promoting open innovation. According to the participants, large businesses mainly launched challenges on OpenIX, while academia and smaller businesses posted their innovations onto the platform as technology offers in addition to submitting solutions to the challenges posed by large businesses. Government plays the role of the intermediary,

TABLE 2: Direct quotations of responses regarding the challenges faced when commercialising ideas the open innovation.

Objective 2	Theme components	Description (*verbatim quotes*)
Challenges faced regarding OpenIX	Protecting intellectual property	'Everything is on a non-disclosed basis, which means it is open for the public'; 'We position it as a non-confidential process'; 'All solutions that we receive are considered to be confidential'; 'We then advise the client and the potentially commercial partner to sign a NDA' 'We would then facilitate the NDA between the solution provider and the challenge owner'; 'We position it as a non-confidential process'; 'We try to advise the solution providers on what content they should be providing'; 'they might seek IP protection first before going a step further'. 'More can be done regarding IP'.
	Collaboration	'coming from this various partners – universities, SMEs and individual innovators'; 'Venture capitalist and dealmakers to actually get easy access'; 'Owners have got different interests'; 'a good entry point for us into quite a few organisations'; '…looking to broaden their relationships'; 'It's essentially been passive because it's under resourced'; 'The aim is not necessarily to drive deal makings'; 'It's a demonstration of our ability to bring in technologies'; 'our role is the intermediary is to facilitate engagement'; 'We don't know if ultimately did it [collaboration/deal-making] happen'; 'And it's very possible that the partnerships that happen outside the website…it's difficult to monitor it'.
	Triple-helix	'The involvement of the triple-helix is to get this underlined process [Open Innovation through deal-making] going'; '…to facilitate the collaboration between triple-helix players'; 'Private sector has become our clients… smaller ones [businesses] become our solution providers'; 'he enabler in this case was government'.; '… government is acting as an intermediary'; 'The universities have given us some technology offers'; '…just opens up a research community'; 'Regarding the actual implementation of the project, a lot of role-players were brought into as steering and advisory committee, we included government, state-owned companies, we included the universities'.

enabling open innovation in Gauteng. Participants mentioned the difficulty of bringing industry and government into the same room.

Table 2 reflects the direct quotations of participants regarding challenges faced on the open innovation platform.

Measuring success

Because open innovation is relatively new in Southern Africa, participants have focused on other measures of the OIA's success apart from the actual deal-making. Table 3 reflects the direct quotations of participants regarding how the success of the platform has been measured.

Participants indicated that the increased numbers of registrations of the platform, submissions to solutions and visits to the website indicate a better awareness of open innovation over time. They added that the platform's alignment with the province's key strategies also serves as a measure of success. OpenIX was launched to boost the Gauteng Employment Growth and Development Strategy and the GIKES (The Innovation Hub 2013:2). One of the key objectives of Gauteng is to stimulate SME development; participants emphasised that the OIA provides opportunities for SMEs as they showcase their technology and, in turn, build their businesses through partnerships and investment.

Participants stated that innovators, SMMEs and universities with different interests are also offered the opportunity to collaborate with desired partners by posing their innovations onto the platform in the form of technology offers. This is in addition to posing solutions to challenges. Participants also mentioned that the platform encourages technology transfer and partnerships between universities and industry on particular business needs.

Stakeholders added that, apart from SMME development, the OIA has tackled service delivery issues by identifying solutions that affect municipalities and are being implemented at the community level.

Conclusion and recommendations

The objective of this research was mainly to investigate an OIA in Southern Africa used to take ideas to market. This was accomplished by firstly discussing factual information regarding the open innovation platform through a literature review and qualitative data; secondly, identifying the challenges faced by the key stakeholders of the open innovation platform; and lastly, identifying the successes of the open innovation platform thus far. From the findings presented in this research, it is apparent that the acceleration of commercialisation through OIAs such as OpenIX, although relatively new in South Africa, should not be overlooked. Conclusions and recommendations regarding the research can be made as follows:

Apart from their own business networks and databases, OIAs need to build an overall innovation ecosystem. This means having a diverse array of members (triple-helix stakeholders) and resources that contribute to and are necessary for ongoing innovation. These include entrepreneurs, investors, researchers, university faculties, venture capitalists and policy-makers. In addition, stakeholders could also include business development and other technical service providers such as accountants, designers, contract manufacturers and skills training and professional development services. Having these different styles of thinking and incongruent understandings will enable OIAs to operate effectively across multiple clusters of specialisation. These cross-industry associations and wide-spread knowledge regarding industry-specific issues may result in the OIA's increased ability to provide multiple value-added services that hold enough legitimacy to influence the development of technology, thereby establishing a common language of reference and transforming interpretations through innovation.

Measuring collaboration is quite a challenge for the OIA. It is recommended that stakeholders look across a range of tools to tell a holistic story. There cannot be one approach that can measure collaboration on its own. Exploring a few different approaches and tools to measure various collaboration efforts is recommended. A strong marketing strategy in addition to collaboration with a media partner is recommended in order to build a culture for and interest in research technologies in South Africa over a longer period of time. Sustainable partnerships need to be built beyond simply requesting the distribution of the challenge brief to industry associations and research institutions. This will grow the platforms database and contribute to building an open innovation ecosystem. Furthermore, a database gap analysis in terms of what is available on the database and what data need to be recruited is recommended.

In order to ensure stakeholder buy-in, it is essential that OIAs involve key stakeholders from the client's side

TABLE 3: Direct quotations of responses regarding the key success factors.

Objective 3	Theme components	Description (*verbatim quotes*)
Open Innovation success	Measuring success	'We are looking for an actual deal'; 'what's the size of the deals over a period?'; 'we identify the number of registrations, submissions, the visits during the campaigning process'; '...measuring the number of solutions that are implemented'; 'It [OpenIX] has to support our incubation and our skills development programs'; 'There are wider benefits and we haven't figured out exactly how to capture it'; 'The project objectives which are driven, which are aligned to the Gauteng objectives'; 'the project managed to stimulate SME's development'; 'By putting challenges of a business's needs on a platform and making the best opportunities visible to the SME's'; 'Yes, we managed to identify solutions that are impacting municipalities'; 'They [solutions] are actually implemented the solution that is now actually impacting lives on community level'; 'We managed to get universities partner with the industries on particular business needs'.

(the solution seeker) during the challenge definition phase of the open innovation project. When stakeholders are involved at this initial phase of the open innovation process, it increases the likelihood of a solution being incorporated and fitted into the organisation's business strategy and day-to-day operations.

The OIA should consider technical measures to actively prevent IP leakage, rather than simply advising the solution providers regarding IP. Various IP protection programmes and methods exist and should be looked into as value-added services.

In conclusion, businesses need to embrace open innovation as it presents opportunities in this fast-paced knowledge economy, thereby increasing a business' competitive advantage. No one structure for open innovation is likely to be sufficient in the future. It is recommended that policy-makers, research institutions and businesses explore various technologies across industries relevant to their open innovation proficiencies. Flexibility is vital when implementing open innovation. Triple-helix role-players embracing open innovation should seek to find approaches of collaboration that are the most appropriate for them and for the open innovation project at hand, keeping in mind that these approaches are likely to change.

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Competing interests

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Authors' contributions

Both authors contributed equally to the work presented in this article.

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