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Roser Award - A mechanism to foster innovation & entrepreneurship focused on society's demands

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Roser Award - A mechanism to foster innovation & entrepreneurship focused on society's demands

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1. INTRODUCTION

The current globalized economy continues to become more knowledge-based with each passing year, and it demands a greater protagonism of education and access to information in societies and communities in general, especially in relation to the fields of innovation and entrepreneurship. According to the OECD (Organization for Economic Co-operation and Development), knowledge gets increasingly complex as advanced research and technology development keep expanding[3], increasing the need for the sharing of information and the creation of links between firms and other organizations. Knowledge-based economies depend heavily on high skill levels, information, and on the tools that grant easy and fast access to these by the business and public sectors. Still according to the OECD, a parallel economic development has been the growth of innovation in services in advanced economies[4]. An upsurge in environmental and social concerns, coupled with a trying economic climate of ever-increasing concentration of wealth, job insecurity and, especially in developing nations, issues of security, health, housing and mobility, has led to the gradual addition of sustainable development into the international agenda, seeking innovative solutions to current challenges.

Change is difficult to the average person. Familiarity is a welcome aspect of adult life and a big part of communities. Humans connect through shared customs, values and culture, and commonly the unknown disrupts the *status quo* and stirs up fear. In an opinion article for Wired Magazine, Estel Masangkay notes that in the context of innovation, there is always room for fear to creep in: fear of failure, fear of disappointment, fear of risking one's reputation and career. Alas, when fear and risk are magnified in the process of innovating, people only do the minimum to avoid unpleasant consequences. Barring the existence of incentives to motivate people to take risks and face their fears, the result tends to be disappointing at best[5].

The proposition of this article is to show that awards and prizes provide an important incentive, beyond intellectual property (IP) rights and expected return of investment (ROI), which motivate people to take chances and accept risks that they otherwise would not. It aims to analyze the methodology of the Roser Award and its results, demonstrating that this initiative truly spurs innovative ideas, entrepreneurship and the exchange of knowledge between the academic and business arenas.

2. CONTEXT

The use of rewards to incentivize specific behaviors is instilled in us from as soon as childhood, from the moment one might get a candy treat for tidying up the room to winning a medal of participation in a sporting event as a teenager or young adult. The fact is that, more than financial compensation, awards and prizes connect with an innate desire to be recognized for one's performance.

Prestigious awards, such as the Nobel Prizes, grapple the imagination of the public as the highest possible recognition for outstanding academic and scientific advances. In no way, however, an award or prize that recognizes success *after* it was achieved is the only way to organize this type of incentive. Historically, awards, prizes and challenges have been used as a way of capturing the

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[3] OECD. 2005. **"The Measurement of Scientific and Technological Activities: Guidelines for Collecting and Interpreting Innovation Data: Oslo Manual**, Third Edition" prepared by the *Working Party of National Experts on Scientific and Technology Indicators*. OECD, Paris, para. 71.

[4] Same as footnote 3.

[5] MASANGKAY, Estel. **Carrots and Cudgels: How to Incentivize Innovation**. Wired Magazine Partner Content. Online. <https://www.wired.com/insights/2013/12/carrots-and-cudgels-how-to-incentivize-innovation/> Retrieved 02-26-2018.

attention and calling to action anyone who is willing to take risks, *before* the execution of the work that leads to the desired outcome.

It must be said, however, that in the areas of product and technology development, IP rights, patents and grants for basic research, remain the most common methods for incentivizing innovation. According to an article by Heidi Williams, "Intellectual property rights systems are perhaps the most common form of policy aiming to increase incentives for innovation. Broadly defined, intellectual property rights create incentives for innovation by granting inventors exclusive rights to market their invention for a fixed period of time"[6]. According to Michael Hendrix, prizes work best for areas with clear intermediate opportunities for success in nascent markets[7].

There is also a significant development that started in the beginning of the 21st century and truly took off in the 2010s, which is the development of democratized technologies that reduce the entry barriers not only for emerging startups, but also for product users and members of a community with an idea or a solution to a problem. Robotics, 3D printing, big data, the emergence of ubiquitous computing, artificial intelligence (AI), virtual reality (VR), augmented reality (AR), the *blockchain* and other technologies enable people to develop concepts that not long ago were only in the realm of capability of large corporations or governments. Another important development, of the late 1990s and early 2000s, is the exponential increase in the usage of the internet around the globe (notably first in developed nations), creating an environment of exchange of information and access to knowledge that was inconceivable only a few decades ago. This has led to the creation of virtual communities of people sharing problems and challenges of daily life, and empowered people to voice their concerns and look for solutions themselves. It has enabled the formation of small and agile teams that are able to collaborate in ways not possible before in history.

2.1. A BRIEF HISTORY OF PRIZES, AWARDS AND CHALLENGES FOR SPURRING INNOVATION

Awards and challenges are one of the most ancient ways of incentivizing discovery and innovation. Michael Hendrix notes that in the Iliad, Homer describes one of the first known prizes in history, "calling on his men to compete in honor of Patroclus, whose death he would glorify through sport. He proclaimed prizes of gold and horses (…)"[8].

In the 18th century, The British Longitude Prize, created in 1714, aimed to solve the problem of finding the longitude once ships sailed beyond sight of land. The prize called for a portable, practical solution to this problem. The British Parliament offered cash prize of 20.000,00 pounds to whoever found the solution, and it was the son of a carpenter with little formal education, John Harrison, and who repaired and made clocks for the gentry, that presented the most successful submission, securing a 10,000.00 pound reward[9]. This levelling of the playing field, with entrants from different technical backgrounds, is one of the key characteristics of induction prizes, along with inspiration. As put by Hendrix, "the sponsor defines the challenge and terms of success. The innovator, in turn, assumes the cost and risks of research and development, while enjoying relative freedom in finding a solution"[10].

Another famous example is the Orteig Prize, which offered a reward of USD 25,000.00 in 1919 for the first aviator to fly non-stop from New York to Paris, or vice versa. It was proposed by New York hotel owner Raymond Orteg through the Aero Club of America, and was first on offer for five years, after which it was reissued in 1925 when it seemed that technology had advanced enough that several men vied for the prize. Charles Lindbergh claimed the prize in 1927, in his aircraft Spirit of St. Louis, after several lives were lost by competitors attempting to complete the crossing. This prize and others like it spurred a flurry of innovation in the then new aviation market, and generated investments several times the size of the prize itself[11].

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[6] WILLIAMS, Heidi. **Innovation Inducement Prizes: Connecting Research to Policy**. Journal of Policy Analysis and Management, Vol. 00, No. 0, 1–25 (2012). Association for Public Policy Analysis and Management. Published by Wiley Periodicals, Inc . Retrieved from <http://www.wileyonlinelibrary.com/journal/pam>

[7] HENDRIX, Michael. 2014. **"The Power of Prizes. Incentivizing Radical Innovation"**. *USCCF. U.S. Chamber of Commerce Foundation*, Washington DC, p. 17

[8] HENDRIX, M. 2014. **"The Power of Prizes. Incentivizing Radical Innovation"**. p. 3.

[9] For more details on the Longitude Prize, see <https://www.nesta.org.uk/news/guide-historical-challenge-prizes/british-longitude-prize>. Retrieved 03-08-2018

[10] HENDRIX, M. 2014. **"The Power of Prizes. Incentivizing Radical Innovation"**. p. 6.

[11] For more on the Orteig Prize, see <http://www.charleslindbergh.com/plane/orteig.asp>. Retrieved 03-15-2018.

A permanent prize that was created in 1987 is the Edison Awards, which has recognized some of the most innovative products, services and business leaders in the world. Named after Thomas Edison (1847-1931), it is an annual competition, originally established by the American Marketing Association and becoming independent in 2008[12], open to innovative organizations around the world. Winners represent game changing products and services, and are evaluated around four criteria: concept, value, delivery and impact.

The XPrize Foundation, founded in 1995, manages public competitions that encourage the opening of new markets and the betterment of humanity through new technologies. Most notably, the Ansari XPrize for suborbital spaceflight was awarded to Scaled Composites in 2004 for two flights, within two weeks, that broke the official 100km boundary of space[13]. This prize, as a consequence, opened up an entirely new market of space tourism – albeit much more slowly than expected – in which the main entrant is Richard Branson's company Virgin Galactic. As with the Orteig Prize, it is interesting to note that while the award purse was ten million dollars, the expenditure of the participating winning team was much greater.

Another award that can be mentioned is the NASA Centennial Challenges, focused in the process of advanced technology development. According to their website, the program offers incentive prizes to generate revolutionary solutions to problems of interest to NASA and the United States. It was initiated in 2005 and competitors are not supported by government funding – awards are only made to successful teams when the challenges are met. Completed challenges include the Green Flight challenge, the Strong Tether challenge and Power Beam challenge[14].

Within Brazil, systematic prizes and awards for innovation can be traced to the work of the CNPq - *Conselho Nacional de Desenvolvimento Científico e Tecnológico* (National Council for Scientific and Technological Development) from the 1970s onwards. CNPq awards act as instrument of diffusion and appreciation of Brazilian scientific and technological development. Winners are students and researchers with relevant contributions to the production chain of science, technology and innovation (STI). The awards have varied themes, categories and public, and contribute to an effective articulation with partner institutions from the public and private sectors[15].

Currently, the most important national award in relation to innovation is the *Prêmio Nacional de Inovação* (National Award of Innovation), an initiative of the *Mobilização Empresarial da Inovação* (MEI), organized by the CNI - *Confereração Nacional da Indústria* (National Confederation of Industry) and by SEBRAE - *Serviço Brasileiro de Apoio às Micro e Pequenas Empresas* (Brazilian Service of Support to Micro and Small Enterprises). The goal of the award is to incentivize and recognize the successful efforts in innovation and innovation management in organizations that operate in Brazil, and eight editions have taken place since 2006. The two main categories are *Innovation Management*, recognizing tools, methods and processes for innovation, and *Innovation*, which recognizes the innovations themselves that contribute to the increase in the competitiveness of a company. It is subdivided in *innovation in products*, *innovation in processes*, *innovation in marketing* and *organizational innovation*[16]. In its latest edition (2016-2017), 3.987 companies participated in the award, out of which 34 went through to the final stage, and 19 won in their respective categories[17].

SEBRAE is another important player in the Brazilian innovation ecosystem and in the support of small and medium enterprises (SMEs), and organizes different types of awards, such as the *Prêmio SEBRAE Mulher de Negócios* (SEBRAE Businesswomen Award), which aims to recognize exemplary women to Brazilian entrepreneurship, and to incentivize and inspire other women to participate in this ecosystem[18].

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[12] For more on the Edison Awards, see <http://www.edisonawards.com/about.php>. Retrieved 03-16-2018.

[13] For more on the XPrize Foundation and their current and past awards, see About and Prizes sections of their website. <https://www.xprize.org/> Retrieved 03-13-2018.

[14] For more on NASA's Space Technology Mission Directorate, see https://www.nasa.gov/directorates/spacetech/programs Retrieved 03-13-2018.

[15] For a list of awards presented by or in partnership with CNPq, see their official webpage. http://cnpq.br/premios2. Retrieved 03-13-2018.

[16] For more information on the *Prêmio Nacional da Inovação*, see the oficial webpage of the award. <http://www.premiodeinovacao.com.br/> Retrieved 03-13-2018.

[17] Data collected from the article "**Anunciados vencedores do Prêmio Nacional de Inovação**". 27 of June, 2017. <http://anprotec.org.br/site/2017/06/anunciados-os-vencedores-do-premio-nacional-de-inovacao/> Retrieved 03-11-2018.

[18] For a list of current awards organized by SEBRAE, see their official webpage. http://www.sebrae.com.br/sites/PortalSebrae/premios. Retrieved 03-11-2018.

Not only private philanthropic organizations and government institutions give out awards, prizes or challenges. Since the late 1990s and especially after the mid-2000s, companies have recognized the value of this method of incentive as a way to spur innovation. Companies from different areas such as Nike (sports clothing and apparel)[19] and Netflix (media production and distribution)[20] have recognized the potential of awards, prizes and challenges to incentivize innovation, especially considering the paradigm of *open innovation*.

It is true that there are a myriad of ways to recognize and interact with external innovation other than awards and challenges, especially considering the work done in STPs (Science and Technology Parks), AOIs (Areas of Innovation) and ecosystems that help nurture the networking of academy, research, SMEs and large companies. It is worth noting, though, that the ever increasing complexity of technology research and deployment to the market will only make the inflows and outflows of technology grow, as a way for businesses to complement and advance the knowledge they obtained individually by internal R&D or outright purchase of technology rights, and also as a way to increase their customer base and access to goods and finance[21].

2.2. DEFINING INNOVATION, SOCIAL INNOVATION, OPEN INNOVATION & INVENTION

The Oslo Manual[22], a set of guidelines for collecting and interpreting industrial information data, defines four types of innovation:

- ***Product innovation***: new or significantly improved product or service;
- ***Process innovation***: new or significantly improved method of production products;
- ***Marketing innovation*****:** new or significantly improved marketing strategy for a product or service, product or packaging design, sales strategy or channel;
- ***Organizational innovation*****:** new or significantly improved business practice, workplace organization or relation with external players and stakeholders.

Open Innovation is not a *type* of innovation as much as it is a *method*. It was defined by Henry Chesbrough in 2006 as:

> *"The use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expands the markets for external use of innovation, respectively. (…) firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology"*[23].

For most of the industrialized period, internal R&D was a strategic asset and an almost insurmountable barrier to entry for smaller companies. Large corporations were able to do research internally, in a *closed* system, and then take advantage of IP and patent rights, and *first mover* advantages. According to Chesbrough, in an article for MIT Sloan Management Review, the end of the 20th century and the information revolution brought forward remarkably strong competition from upstarts. These newcomers conducted little or no basic research on their own, but instead used the market and the exchange of knowledge and information to get their new ideas[24].

The mobility of information and of knowledge workers made it very difficult for large corporations to retain control over their proprietary ideas. Expertise started flowing more freely while private venture capital became a new way of financing new businesses, creating a path forward beyond the usual corporate secrets and closed innovation. Traditional problem solvers in closed settings – manufacturers' internal R&D labs, mostly – are struggling with the current pace of

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[19] See Nike Circular Innovation Challenge. https://www.nikeinnovationchallenge.com/. Retrieved 03-23-2018.

[20] BENNET, J., LANNING, S.. **The Netflix Prize**. 2007. https://www.cs.uic.edu/~liub/KDD-cup-2007/NetflixPrize-description.pdf. Retrieved 03-13-2018.

[21] **Digital Globalization: The New Era of Global Flows.** McKinsey & Company. McKinsey Global Institute. March 2016. p.7. https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/digital-globalization-the-new-era-of-global-flows. Retrieved 03-05-2018.

[22] OECD (2005). **Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data.** OECD Publishing. 3rd Edition. p. 47-52.

[23] CHESBROUGH, H.; VANHAVERBEKE, W & WEST, J. (2006). **Open Innovation – Researching a New Paradigm**. Oxford University Press, New York.

[24] CHESBROUGH, H. **The Era of Open Innovation.** *MIT Sloan Management Review*; Spring2003, Vol. 44 Issue 3. https://sloanreview.mit.edu/article/the-era-of-open-innovation/. Retrieved 03-18-2018.

changes in technology and in the challenges facing societies. The usual specialized development of solutions cannot keep up with an ever changing scenario. Eric Von Hippel, in his book The Sources of Innovation, presents the idea of *user innovation,* meaning that users and consumers are the first to recognize a need and try to come up with an innovative solution. He says that:

> *"The discovery that users are innovators in at least some important categories of innovation propels us into the first major question I examine in this book: Who actually develops the vast array of new products, process equipment, and services introduced into the marketplace? The answer is clearly important: An accurate understanding of the source of innovation is fundamental to both innovation research and innovation management"*[25]

Social innovation, on the other hand, cannot be described purely as a type or method of innovation, but rather as a *goal*. According to the OECD, social innovation can be defined as "a group of strategies, concepts, ideas and organizational patterns with a view to expand and strengthen the role of civil society in response to the diversity of social needs (education, culture, health)"[26]. Still according to the OECD, social innovation is deployed by social entrepreneurs, roughly defined as: having the intention of creating systemic changes and sustainable improvements with a view to sustain the impact; assessing success in term of the impact he/she has on society; intending to provide real social improvements to their beneficiaries and communities, as well as attractive (social and/or financial) return to their investors, among others[26].

But what is innovation in itself? How is it different from invention? In an interview with Andrew Wyckoff, Director, OECD Directorate for Science, Technology and Innovation by the Institute for New Economic Thinking[27], Wyckoff argues that in its simplest terms, "invention" can be defined as the *creation* of a technology, product, process or service for the first time. "Innovation", however, happens when said creation contributes to a change in the market, to productivity gains, to employment, that is, "what innovation does is it takes those inventions and commercializes them, brings them closer to the marketplace". The interviewee mentions the internet as an example of an innovation that was developed by entrepreneurs who saw the opportunity of using *inventions* that could be traced back to funding from the Department of Defense of the United States (ARPANET), and the World Wide Web, which came out of the CERN (European Center for Nuclear Research) project named ENQUIRE[28].

It was the confluence of seemingly unrelated (or tangentially related) technologies that led to a disruption not only in the market, but after a few decades, to a profound change in the way society deals with the exchange of information and technology. Indeed, the internet as an innovation ushered in a true era of *creative destruction* as defined by Schumpeter in *Capitalism, Socialism and Democracy*, of 1942: "The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumer goods, the new methods of production or transportation, the new markets (…)". Indeed one can argue that invention *and* innovation are, in tandem, and in light of Schumpeter's ideas, the motors that kick start the process of industrial development that "revolutionizes the economic structure *from within*, incessantly destroying the old one, incessantly creating a new one." [29].

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[25] VON HIPPEL, Eric. (1988). **The Sources of Innovation**. Oxford University Press, New York. Chapter 2, p.11-15.

[26] HARAYAMA, Yuko. NITTA, Yoko. **FOSTERING INNOVATION TO ADDRESS SOCIAL CHALLENGES . OECD WORKSHOP PROCEEDINGS. OECD, 2011**. P. 11-13. https://www.oecd.org/sti/inno/47861327.pdf. Retrieved 01-21-2018.

[27] WYCKOFF, Andrew. Interview with Marshall Auerback . New Economic Thinking, published on Published on Dec 9, 2015. <https://www.youtube.com/watch?time_continue=16&v=apbIP5zutUQ>. Accessed 03-11-2018.

[28] For more on the birth of the World Wide Web and project ENQUIRE, see https://home.cern/topics/birth-web. Retrieved 03-02-2018.

[29] For more on creative destruction, see Chapter VII of SCHUMPETER, Joseph A.. **Capitalism, Socialism and Democracy**. 3rd Edition, 1950. HarperCollins Publishers. New York, 2008.

2.3. TYPES OF INCENTIVES FOR INNOVATION

In 2009, in one of the most relevant and complete reports on the status and perception of prizes and awards as incentives for innovation, McKinsey and Company's "And The Winner Is…" noted that:

> *"The unique attributes of prizes make them well-suited to achieving a number of philanthropic goals (...) intelligent investment in prizes can create more and more distinctive societal benefit, and we believe that a growing "prize sector" and attendant infrastructure will increase this impact and make prizes a viable option for more sponsors."*[30]

Besides the incentive given by intellectual property rights and patents, the aforementioned report shows that the most common type of incentive is the effort-based *grant*. It is given for speculative efforts and does not guarantee results. It is the main way to fund basic research. Another form of incentive that does not guarantee results is the *investment*. It is similar to a grant, but is mostly given to institutions in order to build capacity or infrastructure, carrying less strict conditions than a grant. Another form of incentive is the *fee*, which works as a payment to the supplier for providing a service or good, except that the payment is made by a philanthropist or public institution, instead of the recipient of the service or good. This method of incentive is given for a specific objective, and usually defines, but does not guarantee, results[31].

The article goes on to demonstrate that prizes, awards and challenges are a way of incentivizing work, innovation, risk taking and new ideas that give out the reward only *after* specific results are achieved. This type of incentive is especially well suited to solving problems for which the objective is clear, but the way to achieve it is not. It is also well suited to identifying new levels of excellence, focusing communities on specific problems, strengthening their problem solving abilities, and mobilizing new talent[32].

According to Hendrix, prizes work by having a particular entity define a problem and then offer a reward for a solution[33]. The reward may be financial or not. The author goes on by noting that the sponsor defines the challenge and terms of success, and the innovator assumes the costs and risks of research and development. Importantly, anyone, as long as willing, can compete. Prizes are one of the most important artifices in democratizing problem solving[34].

The end goal of a prize is the development of new technologies and innovations. Therefore, an important issue is that of ownership of these (technologies and innovations). According to Williams, a variety of arrangements are possible and have been implemented: the control of the technology by the sponsor of the award or the right for an exclusive license, the requirement of putting the technology in the public domain or, even, allowing the IP rights in the hands of the inventors[35], maybe in the hopes that the inventors will take the innovation and turn it into a business.

Prizes can induce innovation and change *a priori*, that is, by setting out a goal or a challenge and then asking problem solvers to come up with a solution, and *a posteriori*, that is, by recognizing excellence after it is achieved. Whichever way the activity is set up, according to the McKinsey report "And the Winner Is..." there are six main archetypes of prizes, as shown in the figure below:

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[30] **"And the Winner Is..." Capturing the Promise of Philanthropic Prizes**. McKinsey and Company, 2009. p. 13.

[31] **"And the Winner Is..." Capturing the Promise of Philanthropic Prizes**. McKinsey and Company, 2009. p. 36.

[32] For a detailed presentation of the seven ways by which prizes influence society or specific communities, see **"And the Winner Is..." Capturing the Promise of Philanthropic Prizes.** McKinsey and Company, 2009. p. 20-27.

[33] HENDRIX, Michael. 2014. **"The Power of Prizes. Incentivizing Radical Innovation"**. p. 2.

[34] HENDRIX, Michael. 2014. **"The Power of Prizes. Incentivizing Radical Innovation"**. p. 6.

[35] WILLIAMS, Heidi. **Innovation Inducement Prizes: Connecting Research to Policy.** Journal of Policy Analysis and Management, Vol. 00, No. 0, 1–25 (2012). p. 14.

	Archetype	Goal of prize	Primary change levers
	**Exemplar**	· Focus attention on, set standards in, and/or influence perception of a particular field or issue	· Identifying excellence · Influencing perception
	**Exposition**	· Highlight a range of best practices, ideas, or opportunities within a field	· Identifying excellence · Mobilizing capital
	**Network**	· Celebrate and strengthen a particular community	· Identifying excellence · Strengthening community · Mobilizing capital
	**Participation**	· Educate and change behavior of participants through the prize process	· Strengthening community · Educating/improving skills
	**Market stimulation**	· Emulate market incentives, driving costs down through competition and exposing latent demand	· Identifying excellence · Mobilizing talent, capital · Focusing a community · Influencing perception
	**Point solution**	· Solve a challenging, well-defined problem requiring innovation	· Focusing a community · Mobilizing talent

Figure 1: the six archetypes of prizes. Source: McKinsey & Company (2009).

These archetypes are a good demonstration of the flexibility of prizes and the different ways through which they can incentivize innovation. Either through identifying excellence, strengthening the community, mobilizing talent or influencing perception, the use of this method of incentive is an interesting option for all kinds of sponsors, from philanthropic organizations, and governments to the private sector and hybrids such as STPs and AOIs, which merge the private sector, public sector and academia.

2.4. GENERAL CONCEPT OF UNISINOS, TECNOSINOS TECH PARK AND UNITEC

Founded in 1969 in the city of São Leopoldo, the University of Vale do Rio dos Sinos (UNISINOS) is a private university with its two main campus located in the south of Brazil, in the state of Rio Grande do Sul. With over 28 thousand students, it currently has a presence in 8 Brazilian states, and has as its mission the integral formation of the human being and its training to the professional exercise, through the production of knowledge, continuous learning, solidarity and work for the development of society.

Founded in 1999, TECNOSINOS Tech Park main strategic orientation is closely associated with contributing to the development of a knowledge-based economy in its region, with an approach that incentivizes and expects new solutions to current challenges to have social impact. TECNOSINOS and its incubator UNITEC integrate the s*trategic planning* of the University, with the purpose of encouraging entrepreneurship and the incubation of companies, supporting the formation of enterprises with a technological basis and their insertion in the market, and the development of entrepreneurs, with a specific focus on the development of the region.

In the context of areas of innovation (AOI), TECNOSINOS and UNITEC are part of a community of 94 STPs[36] and 384 incubators in Brazil, supporting over 3.800 companies and generating over 30.000 jobs[37]. Indeed, STPs and incubators are especially well suited to provide value-added services that promote growth and networking among supported companies and also with the local and regional community. Since 2013, UNITEC has been reviewing its incubation processes in order to comply with the CERNE (*Centro de Referência para Apoio a Novos*

[36] ABREU, I. B. L., VALE, F. S. V., CAPANEMA, L., GARCIA, R. C. B. **Parques tecnológicos: panorama brasileiro e o desafio de seu financiamento.** Revista do BNDES 45, June 2016. p. 99-154.

[37] GARCIA, F.P., BIZOTTO, C. E., PIRES, S. O., CHIERIGHINI, T. **Reference Center for Business Incubation: a proposal for a new model of operation.** ANPROTEC. p. 5. http://www.anprotec.org.br/Relata/artigoCernNBIA.pdf. Retrieved 03-18-2018.

Empreendimentos) Model, as a way to develop sustainable businesses in a systematic way. The CERNE platform hopes to improve the results of incubators in Brazil[38].

By extending TECNOSINOS' capacity to receive new business enterprises, and as part of the sustainability plan of UNITEC and its expansion, a series of actions based on the CERNE Model were conceived and implemented with the goal of improving the quality of the prospection of innovative businesses for the incubator.

UNITEC was involved in structuring the initiative of the *Eixo de Empreendedorismo (*Entrepreneurship Axis), in the creation of the *Prêmio Roser de Empreendedorismo e Inovação* (Roser Award of Entrepreneurship and Innovation), in the installation of NEI - *Núcleo de Empreendedorismo e Inovação* (Innovation and Entrepreneurship Nucleus*)* at the incubator and, currently, is formally part of the structure of the *Educação Empreendedora* (Entrepreneurial Education) area of UNISINOS University.

The program of Entrepreneurial Education is structured around continuous actions that aim to sensitize and qualify the community in regards to the entrepreneurial and social impact innovation themes with the Entrepreneurship Axis and NEI Mentorships programs; and specific activities that aim to leverage new cycles of mobilization towards new enterprises: The Roser Award and *Semana de Empreendedorismo* (Entrepreneurship Week). Through these initiatives TECNOSINOS hopes to identify, foment and train entrepreneurial talents in the University`s environment, connecting those talents with the innovation and entrepreneurship ecosystem in practice.

UNITEC integrates the group of activities of the disciplines of the *Eixo de Empreendedorismo* of the University. In this program, students have the opportunity to visit and partake in activities at UNITEC, being welcomed by members of the technical area of the incubator who present the innovation ecosystem, and by incubated entrepreneurs who share their experiences and trajectory with the students. A similar program, called *Talentos TECNOSINOS* (TECNOSINOS Talents), is offered to the external community, albeit with somewhat less depth, in which high school students are welcomed at UNITEC for a series of activities which include a presentation of the innovation ecosystem, the STP and the incubator, and technical visits to incubated and consolidated companies. Over 1.000 people are introduced to the TECNOSINOS ecosystem annually, with the goal of instilling an entrepreneurial spirit in the community from an early age and providing students and visitors alike with a basic understanding of a science and technology park.

2.5. THE BIRTH OF THE ROSER ENTREPRENEURSHIP AWARD

As part of the sustainability plan of UNITEC, a series of actions were designed and implemented in order to enhance the qualified prospection of new innovative business for the incubator. In 2009 an approach process was initiated with the UNISINOS University Schools, along with the School of Management and Business: on the one hand with the purpose of fostering entrepreneurship and innovation in the academic community, on the other, providing visibility to the actions of the incubator to the students of the University who are potential new entrepreneurs.

As an incubator, its role is to stimulate innovation and entrepreneurship and connect different actors together in the pursuit of sustainable development. From an annual agenda, UNITEC continuously promotes actions aimed at raising awareness among the community about innovation and entrepreneurship, as well as the prospection of new businesses in line with the Incubator's areas of activity. One of the major events promoted by UNITEC, in partnership with the University, is the Roser Award of Entrepreneurship and Innovation.

Since 2012, UNITEC runs the annual competition, aimed at the development of technological solutions that result in an impact on society's needs. The award is a mechanism to contribute with the entrepreneurial agenda in the Park and Academic community through a qualification program for potential entrepreneurs, seeking to prospect and support new businesses with socio-environmental impacts.

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[38] For more information on the CERNE platform, see GARCIA, F.P., BIZOTTO, C. E., PIRES, S. O., CHIERIGHINI, T. **Reference Center for Business Incubation: a proposal for a new model of operation.** ANPROTEC. http://www.anprotec.org.br/Relata/artigoCernNBIA.pdf. Retrieved 03-18-2018.

Promoted by UNITEC, the Roser Award also involves the participation of UNISINOS University's professors and the public sector through the relation with the Municipality of São Leopoldo (Municipal Secretariat of Economic and Technological Development). The participation of other partners, especially from the private sector, is dependent on the approach and thematic guidelines selected for each edition of the award.

In 2015, UNITEC was selected to participate in an Incubation and Acceleration Impact Program promoted by ICE (*Instituto de Cidadania Empresarial*), ANPROTEC (*Associação Nacional de Entidades Promotoras de Empreendimentos Inovadores*) and SEBRAE with the focus on strengthening the work of incubators working with social and environmental impact businesses. Since then, UNITEC has improved its mechanisms of selection and qualifying programs considering the socio-environmental approach, offering specific training for entrepreneurs selected by the Roser Award and subsequently incubated. Nowadays the Roser Award is the main mechanism for attracting, and prospecting social impact businesses to TECNOSINOS.

3. METHODOLOGY OF THE ROSER AWARD

The Roser Award of Entrepreneurship and Innovation is defined as an annual competition between students, professors and collaborators of UNISINOS University and companies of TECNOSINOS Tech Park (see Table 1 below) with the goal of identifying opportunities and generating new enterprises with incubation and growth potential. The proposal to merge undergraduate students with graduate students and market professionals working in technology based companies is intentional and strategic, as this facilitates the promotion of integration of academic knowledge with business dynamics.

Participants of the Roser Award	
1	Undergraduate Students of UNISINOS
2	Graduate Students of UNISINOS
3	Professors of UNISINOS (any kind)
4	Researchers of UNISINOS
5	Collaborators of UNISINOS
6	Collaborators of the TECNOSINOS ecosystem
7	External participants are allowed, as long as the team includes members of the UNISINOS ecosystem listed above

Table 1: the Types of participants allowed to compete in the Roser Award.

The Roser Award call for proposals is based on thematic guidelines that point out socio-environmental challenges. The 2017 edition, for example, focused on seeking innovative and scalable solutions to the different dimensions of city life, with São Leopoldo as a "laboratory" and source of inspiration. The challenges were presented in a storytelling approach, considering the following areas: education, habitation, mobility, environment, health and public security. A table presenting the thematic guidelines of each edition of the award is presented below:

Evolution of the thematic guidelines proposed by the Roser Award	
2012	Two main themes were accepted: Line 1 - Development of innovative apps in the areas of health, education or environment. Line 2 - Development of new solutions using RFID technology, Internet of Things (IoT), ubiquitous computing, embedded systems, smart grids, energy efficiency and alternative energy, solutions for the creative industry or new sources of nutrition
2013	Only projects related to Information Technology (IT) applied to the creative industry, audio and video, health, automation, engineering and apps in general were accepted.
2014	Only projects related to solving cities' problems in the areas of health, security, mobility, education and environment were accepted.
2015	Only proposals and ideas related to using technology to solve social problems connected to the areas of health, security, mobility, education and environment were accepted.
2016	Only projects related to using technology to solve problems in the areas of health, security, mobility, education and environment were accepted.
2017	The Roser Award wanted to incentivize the generation of new businesses that propose innovative and scalable solutions to the different dimensions of life in the cities, having São Leopoldo as a "laboratory" and source of inspiration. The focus was to find technological solutions to demands in the following areas: education, housing, mobility, environment, health and security.

Table 2: Thematic guidelines of the Roser Award (2012-2017).

The Roser Award happens in three stages: workshops, mentorship and final pitch. The first stage consists of the presentation of the concept of socio-environmental impact challenges and a 10 hour immersion of workshops, in which the following topics are addressed: entrepreneurial profile, design thinking, business modeling and growth plan. During this stage, individually or in groups, the teams work on the idea/opportunity to develop/enhance their project proposal. After the workshops, the proposals go through a pre-evaluation, out of which the 10 best projects are selected to go through to the next stage. The mentorship stage consists of a pitch workshop and individual consultations with experts for one week. The goal is to qualify the project proposals and to prepare the entrepreneurs to the final selection jury. In the final stage, participants defend (*pitch*) their projects orally in front of a jury comprised of academics and market professionals with relevant backgrounds in science, innovation, entrepreneurship and technology, so that the jury can select the winners. Currently, the selection criteria are based on the CERNE model and focuses on four aspects of the project, presented in the following table:

Criteria	CERNE Axis
1 – Entrepreneurial Spirit: Evaluates if the candidate has an entrepreneurial spirit and the capabilities to develop a business.	Entrepreneurial
2 – Degree of Innovation: Evaluates the degree of innovation of the submitted proposal as it pertains to its Market differentiation.	Market and Technology
3 – Technical/Economic Feasibility: Evaluates if the proposal is technically and economically viable, and if the presented information is coherent.	Capital
4 – Entrepreneur Competency: Evaluates if the entrepreneurs have the core competencies to develop the proposed business.	Management
5 – Business Model: Evaluates if the business model is aligned with the value proposition of the company.	Management

Table 3: The methodology of the award – the criteria for project evaluation

Highlights of the methodology applied during the activities are presented in the table below:

Current Methodology Highlights of the Roser Award
Spontaneous formation of teams: the team participants can be assembled before or during the period of competition, leading to higher multidisciplinarity.
Lean Startup methodology: instead of focusing on a business plan, the competition makes the participants to "go out on the street" to test the viability of their ideas.
Diverse teaching: interchange between content presentation and experiential themes, besides collective and individual monitoring.

Table 4: The methodology of the award – highlights and particular characteristics

The award activities culminate with the presentation of the winners in a solemnity during the Innovation and Entrepreneurship Week at UNISINOS University, which as of 2017 has happened in the month of October. Besides the participation certificate, the 1st place receives 6 months of exemption of the incubation costs, and the 2nd and 3rd places, 3 months respectively.

For undergraduate students, activities of the Roser Award are continuous throughout the year, since the professors that take part in the activities are part of the Entrepreneurship Axis – thus guaranteeing technical and competencies support to the students in the classroom.

The collection of primary data is done during and after each edition of the Roser Award by the UNITEC team, using different methods: collection of data from submitted projects, presence sheets, photographs and videos, feedback of each activity filled by the participating teams, and collection of information on the regional influence of the award based on news coverage – this information is compiled in a report for each edition of the award.

4. RESULTS AND FINAL REMARKS

The six editions of the Roser Award already held show the effectiveness of academic and market integration. Innovative projects by UNISINOS undergraduate students have already been consolidated into new companies that are currently part of the university incubator ecosystem. Over 140 projects were submitted and more than ten businesses of social and environmental impact were identified and selected, that is, businesses that manage to propose solutions of daily problems through the use of technology. However, what is perceived is that, either with a specific or a broader objective, the Roser Award is having an impact and helping to generate solutions and projects to improve the lives of communities and society as a whole. A more detailed presentation of the basic primary data collected is shown in the table below:

ROSER AWARD							
Edition	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**TOTAL**
People participating in inaugural class	31	100	122	78	51	24	406
Submitted Projects	11	17	13	56	33	12	142
Projects selected to final jury	9	10	9	10	10	10	58
Finalist projects	5	5	4	5	5	5	29
Finalist projects turned into incubated start-ups	2	2	2	3	1	0*	10

*incubation process due to start in 2018

Table 5: Results of the Roser Award in 5 different criteria

A table of the winners of the Roser Award and their projects, by edition, is shown in the table below:

Winners of the Roser Award by edition		
2012	MS AVAN	An online tool for health professionals that calculates and stores anthropometric evaluation data
2013	Meu Presente	Mobile app for the purchase of digital gift cards
2014	Silo Verde	Grain, feed and raw material storage system, developed from recycled materials, with innovative, practical and low cost format
2015	Vital	Alternative method in the production of lactobionic acid, offering a quality product, with a cost reduction of 50%
2016	Pulsetec	Wristband that monitors health risks in admitted patients in hospitals and clinics to improve treatment efficiency
2017	Freewood	Solution for affordable housing through materials engineering for sustainable production

Table 6: Winners of the Roser Award

It is clear, from the analysis of the data presented in this article, that the Roser Award mobilizes the UNISINOS and local community, and that important businesses and solutions for social problems derive from the initiative. However, as a matter of policy, especially in Brazil where a lot of data is lacking, further studies of the effectiveness of awards as a general way of incentivizing innovation should be conducted.

However, studies specific to the Roser Award and other awards in Brazil do not touch directly on the issue of the effectivity of the initiative: this issue has been noted in the article Innovation Inducement Prizes: Connecting Research to Policy[39], in which the author notes that the

[39] For the complete article by Heidi Williams, see **Innovation Inducement Prizes: Connecting Research to Policy**. Journal of Policy Analysis and Management, Vol. 00, No. 0, 1–25 (2012).

fundamental problem is how to estimate how the innovation would have evolved had the prize not have been offered. Bays et al made a survey in 2009 that showed that only 23 percent of prize administrators annually evaluated the impact of their prizes and advised an examination of aspects such as the generation of investments for winning proposals or the sustainability of the community of participants[40].

For the last few years, the new entrepreneur has become able to align the generation of impact with the generation of revenue – something that was not common in a merely capitalist society in which making money was not associated with doing good. It is up to all the members of the innovation ecosystem, from the public and private sectors and academia, to disseminate this information to the new generation of entrepreneurs, and the Roser Award is a mechanism to promote this movement, in which University, companies, students, entrepreneurs and community unite for a better future.

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[40] BAYS, J., GOLAND, T., NEWSUM, J. **Using prizes to spur innovation.** McKinsey & Company. July 2009. https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/using-prizes-to-spur-innovation.