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**Dynamic Capabilities of Business Incubation for new Concepts of Services:
A Best-Practice Case Study of ITU Technology Park in Turkey**

Parallel Session 3

"Innovation support services: inspiring examples (2)"

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Executive Summary

Emergence of a dynamic entrepreneurship ecosystem around a technology park requires crafting of a number of endogenous service mechanisms, as well as orchestration of a series of external potencies. In this paper, we develop a case study of the emergence of the entrepreneurship ecosystem around Istanbul Technical University, with the help of a number of service mechanisms for business incubation that are designed and operated by ITU ARI Teknokent. These mechanisms involve an integrated and comprehensive early-stage incubator/accelerator/competition, a scale-up incubator for established start-ups and an international acceleration program for post-revenue start-ups and born-global early stage teams. According to this model, any start-up that wants to benefit from this integrated approach, may select a matching program according to their maturity level and their desired impact. The approach has generated dynamic interactions and major start-up accumulation around ITU ARI Teknokent, making it one of the most successful science parks of Turkey.

Introduction

Business incubators have been receiving an increasing interest, as economic significance of start-ups gets more acknowledged across developed and developing countries. Numbers of governmental or non-governmental incubators are flourishing, inside or outside of technology parks, with for-profit or non-profit business orientations. In order to assess diverse types and approaches to business incubation, a considerable amount of research has been conducted (Mian, 1996; Aernoudt 2004; Mian 1996, 1997; Chan and Lau, 2005; Mian, Fayolle and Lamine, 2012).⁸³

Extant literature focuses on singular support mechanisms, targeting a focal service, rather than a systemic and comprehensive approach that orchestrates a number of different services that target different start-up and founder profiles. However, a supportive entrepreneurship ecosystem requires co-existence of a number of elements, from access to finance to supporting infrastructures to provide an enabling environment for entrepreneurs (Nadgrodkiewicz, 2013).⁸⁴

In this paper, we develop a case study of the emergence of the entrepreneurship ecosystem around Istanbul Technical University (ITU), with the help of a number of service mechanisms for business incubation that are designed and operated by ITU ARI Teknokent, the science park of the university.

⁸³ Aernoudt, R. 2004. Incubators: Tool for entrepreneurship? *Small Business Economics*, 23, 127-135.

Chan, K. F. and Lau, T. 2005. Assessing technology incubator programs in the science park: the good, the bad and the ugly. *Technovation*, 25, pp. 1215-1228.

Mian, S. A. 1996. Assessing value-added contributions of university technology business incubators to tenant firms. *Research Policy*, 25, pp. 325-335.

Mian, S. A. 1997. Assessing and Managing the University Technology Business Incubator: An Integrative Framework. *Journal of Business Venturing* 12, pp. 251-285.

Mian, S. A., Fayolle, A. and Lamine, W. 2012. Building sustainable regional platforms for incubating science and technology businesses: Evidence from US and French science and technology parks. *Entrepreneurship and Innovation*, 13(4): 279-291.

⁸⁴ Nadgrodkiewicz, A. (2013, November 15). Building Entrepreneurship Ecosystems. Retrieved from <http://www.cipe.org/publications/detail/building-entrepreneurship-ecosystems-0>

Becoming a Major Center of Entrepreneurship Ecosystem with Integrated Service Mechanisms

ITU is a state university that has been founded in 1773 as the Imperial School of Naval Engineering of the Ottoman Empire. With a history stretching back more than 240 years, ITU currently offers graduate and postgraduate education on a wide range of fields. Over time, ITU has built a variety of entrepreneurship platforms and a major science and technology park called ITU ARI Teknokent in order to contribute national competitiveness of Turkey. Today, ITU ARI Teknokent has become a major attraction for technology companies and an important interface for university-industry collaboration in Turkey. It has numerous facilities encompassing an area of more than 120.000 m², to commercialize technology-based knowledge and create an entrepreneurial ecosystem around ITU, focusing on R&D and innovation.

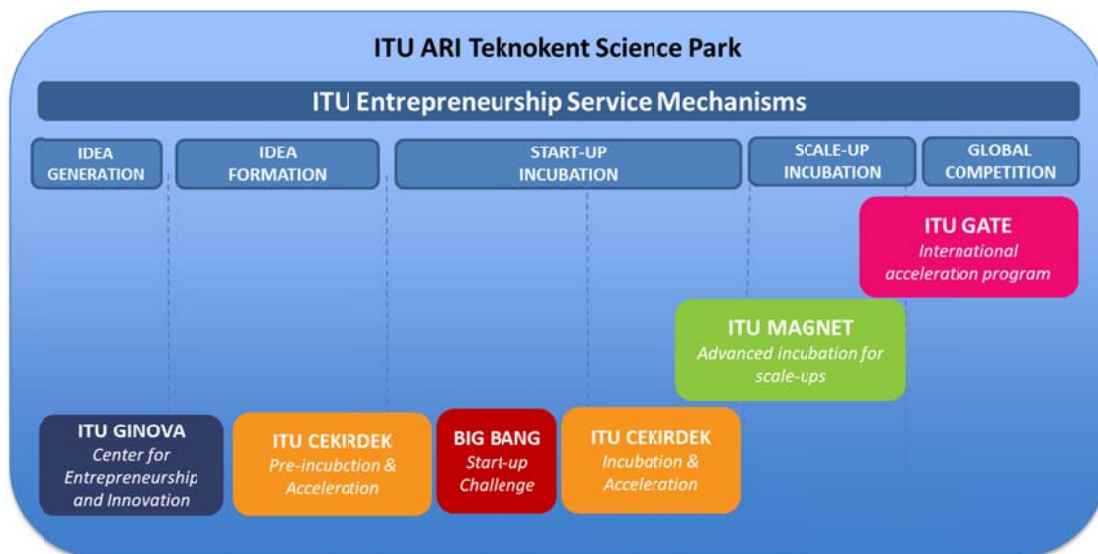


Figure 19. Istanbul Technical University - Service Mechanisms for Enabling Entrepreneurship at ITU ARI Teknokent

The overall service architecture for incubation and entrepreneurship support consists of a number of elements at ITU. They are ITU Ginova Center for Entrepreneurship and Innovation, ITU Cekirdek Early Stage Incubation Center, Big Bang Start-Up Challenge, ITU Magnet Advanced Incubation Center for Scaling-Up and ITU GATE International Acceleration Program. These programs and centers offer different advantages and offers to different levels of start-ups at various stages of their life-cycle (See Figure 1).

ITU GINOVA Center for Entrepreneurship and Innovation

ITU Ginova is an applied research center at Istanbul Technical University, focusing on innovation and entrepreneurship. It acts as a preliminary support center for all entrepreneurship related activities on campus, together with the Entrepreneurship student club. It not only prepares students to more comprehensive stages on the service mechanisms, but also hosts interested researchers, provide mentoring and guidance to students and help them establish their team in their first start-up projects to get experienced. It also actively promotes entrepreneurship culture on campus among faculty members and students. There is an organic coordination between ITU Ginova and ITU Cekirdek and best student teams that establish, learn and grow at ITU Ginova, naturally continues with the other incubation services of the university. While all other incubation mechanisms are open to the entire country, ITU

Genova focuses only on ITU campus, ensuring ITU students get prepared and be successful in the other incubation programs. It primarily acts as a preparatory class for the other incubation mechanisms.

ITU ÇEKİRDEK Early Stage Incubation Center: Pre-incubation Stage

ITU Çekirdek is the early stage start-up incubator of ITU ARI Teknokent. According to literature, during the early stage, death rates of the start-ups are the highest and few of start-ups could survive in the longer term. In order to enable their survival, incubators provide financial and non-financial resources and business support services during this period. However, 80% of Çekirdek alumni are able to survive more than two years, as the selection and support mechanisms of Çekirdek resembles market mechanisms and very competitive.

With its 'Pre-Incubation', 'Accelerator', 'Competition' and 'Incubation' phases, ITU Çekirdek provides in a single platform, all tangible and intangible resources during 2-year period in order to increase the survival and success rates of its tenants. The comprehensive structure of ITU Çekirdek program involves a number of different capabilities, including training, prototyping lab, consulting, mentorship and opportunities to access finance. Start-ups admitted to ITU Çekirdek to date are in a variety of fields including environment, electronics, chemicals, defense, software, naval architecture, mechanics, virtual reality, augmented reality, and agriculture. During the pre-incubation period, start-ups are actively scanned and filtered for their learning progress and market-focused activities. Those, who are not active towards their customers and/or have limited learning capability, are actively filtered out to provide more resources to better start-ups that learn more and more active on their respective markets. Those who can survive in the pre-incubator and reach an MVP or later are eligible to enter the competition phase and may be rewarded as seed-capital and ability to continue the incubation year.

İTÜ Çekirdek receives and processes new applications every week. In this way, start-ups can enter the pre-incubation program without waiting for months until the next cycle. While cycles are annual, any start-up can apply and join that years cycle or continue working for the next year's cycle based on their own decision. In 2016, ITU Çekirdek received 5.606 start-up teams as applicants at the early-stage. This is a massive scale, as the number of startups registered on Angel List site is just 1.091 for Istanbul and 1.164 for the whole country (as of April 2017). As these applicants are mostly new start-ups, ITU Çekirdek is very functional in scaling up to entrepreneurship ecosystem and bringing up new founder talent in Turkey.

Once start-up teams are received to the pre-incubation stage, they are allowed to use a co-working space, where typically all teams work side-by-side. During the pre-incubation period, the idea-stage teams are expected to develop a beta-prototype, whereas teams with more-or-less functional prototypes are asked to further develop their first products according to customer needs and preferably start producing and selling their products to their target customers. During this stage, companies are also provided with 8-week acceleration training and expected to deliver some results according to the week's material in the next week's mentoring day. In this way, founders not only get trained and understand the dynamics of the entrepreneurship ecosystem but also practice their learning on their own project by using design thinking methodology. The results of these practices are reviewed with a mentor every week, who are volunteer seasoned entrepreneurs or experts from the industry, who are knowledgeable about the start-up business modeling, business planning, and execution.

During the pre-incubation period, the teams are also invited to use the prototyping lab, if they are doing something physical. Both physical and logical product start-ups also receive the opportunity to be

introduced to relevant faculty members at ITU. For example, if a certain group need a specific hardware for their project and that hardware or infrastructure is already available at some ITU lab, then the entrepreneur team is introduced to the relevant faculty members, which provide them the necessary training to use the respective laboratory and the required access during the project. This also provides the start-up founders a very critical network of domain-related faculty members that help those teams to grow their business network and the overall understanding of technical and business issues about their project. If start-up needs to have a certain material, they may also demand from ITU ARI Teknokent. If the assessment committee gives a positive answer, all related machinery and materials are bought by ITU Çekirdek, within the budget limits. Currently, a 40.000 € total amount is allocated to this fund for the material, hardware and software requirements of this year.

BIG BANG Startup Challenge

In every November, ITU Çekirdek organizes the Big Bang demo day event for all start-ups that have reached a minimum viable product or higher maturity at the pre-incubation stage. The Big Bang is among the few top-notch events in the Turkish start-up ecosystem. It is also the 3rd start-up event in Europe and the 6th start-up event in the World, in terms of the total seed money distributed and invested in a single event.

During BIG BANG, start-up founders, serial entrepreneurs, angel investors, other business people and students are invited to a large conference center at ITU, where they listen to pitches of those start-ups or start-up candidates. The whole event is also broadcasted on the Internet and receives high coverage from the conventional media channels. A panel of 40 select investors, founders and business people evaluate and question the pitches in front of the online and physical viewers, and selecting the top performers. Starting with 2016, ITU ARI Teknokent has also begun to invest in best of its start-ups together with angel investors and investor networks. For seed capital in 2016, the Big Bang distributed TRL 1.615.000 as investment and TRL 3.200.000 as awards in partnership with a number of corporate sponsors and investment funds.

| | 2012 | 2013 | 2014 | 2015 | 2016 |
|---------------------------------|---------|---------|---------|-----------|-----------|
| Number of Applications | 700 | 800 | 1.000 | 3.900 | 5.606 |
| Competing Co-founders | 27 | 60 | 98 | 502 | 711 |
| Competing Groups | 11 | 24 | 39 | 250 | 300 |
| Mentor Meetings | 35 | 80 | 185 | 2.649 | 3.426 |
| BigBang Investment (TRL) | 0 | 0 | 0 | 0 | 1.615.000 |
| BigBang Award (TRL) | 100.000 | 150.000 | 365.000 | 1.000.000 | 3.200.000 |

Table 1. ITU Cekirdek and Big Bang Statistics

ITU CEKIRDEK Early Stage Incubation Center: Incubation Stage

After the Big Bang, successful companies are welcome to the incubation stage. Incubation co-locates with the pre-incubator with a number of dedicated office suites and open office allowance. The Top-5 teams are awarded with the suites and the second 5 are allowed to use the co-working space as their registered office with their team members for free for one additional year. In this way, the best teams

of the last year and the pre-incubation teams of this year are co-located for interaction, peer-to-peer learning and sharing. At the incubation stage, teams are also invited to register their companies.

To coach the teams during the execution phase, ITU ARI Teknokent actively follows start-ups at the incubator to encourage them to keep their business plans up-to-date in the face of contextual and internal changes. At certain milestones or for certain cost items in the business plan, the start-ups are allowed to use their rewarded funds, according to their business priorities. In this way, the founders learn financial planning, budgeting, and management control practices with the guidance from ITU ARI Teknokent.

Longitudinal mentorship is also provided, as a very valuable resource for the incubation teams. In this way, entrepreneurs are able to reach the market knowledge, experience, and the business networks to make efficient use of limited resources available to them and accelerate their processes. Emphasizing that efficient use of time is one of the most important criteria for a startup to success, ITU Çekirdek is aware of its responsibility of providing a wide range of mentors, who will provide guidance and help for the entrepreneurs. ITU Çekirdek uses a special management and communication platform, called "Mentornity", for mentoring and coaching. On this platform, while mentors can make the meetings, take notes about the mentorship session and give feedbacks to entrepreneurs, entrepreneurs can rate mentors and report them in case of an unethical approach. In this way, the mentoring process, style and maturity of individual mentors are also actively tracked and reported, giving opportunities of improvement to respective mentors. Currently, there are more than 250 mentors in the program, all of which have signed a specific code of ethics documents according to their mentor profile as "pro-bono mentor", "investor mentor" or "mentor".

To reflect vertical needs, ITU Çekirdek have started collecting applications in cooperation with General Secretariat of Automotive Exporters' Association (AEA) for its new category named "Automotive Technologies". Entrepreneurs who have ideas or startups for all parts and accessories such as driving safety systems, sensor equipment, battery technology, engine technology, composite materials and automotive interior technology that make up a car may apply to this category. Entrepreneurs in this category are able to benefit from a special budget valued 20,500€ for their prototypes, which is specially allocated to them, and a special cash prize of 65,000 € that AEA will provide during BIG BANG. Every week for 5 months, mini-seminars are given by sector professionals and a mentor dedicated to this category with the title of "ITU Çekirdek Pit Stop Automotive Network and Sales Development Program" for the automotive sector only. In 2016, automotive category entrepreneurs benefited from 240 hours of mentorship sessions, 301 hours of entrepreneurship seminars, and 92 hours of training. After getting successful results in the automotive category, ITU Çekirdek decided to carry what it learned into new categories with new category partners from industry leaders.

Recently, ITU Çekirdek detected that there is an area of improvement to support the early-stage start-ups, by orienting them more towards the market and their customers. In order to do that, start-ups are asked to determine the target segment of their customers, create a suspect list for potential customers, do cold calls to them to have the first contact and conduct a sales process to increase their market knowledge. This works especially well with B2B start-ups. Similarly, B2C start-ups are also asked to approach their customer, increase their customer knowledge, simulate and improve their sales processes. Based on these, a "sales coaching" system is designed addressing the need of the sales support. A dedicated mentor provides one-to-one sales coaching to startups in need on the topics of how to detect and how to get in contact with potential customers, how to prepare a sales proposal, and how to track this sales process. A "rating board" is placed in the co-working space to materialize this

purpose and give a strong signal of dedication to start-ups. Every month, celebrations are organized to motivate successful sales results of the start-ups.

ITU MAGNET Advanced Incubation for Scaling-Up

According to Coleman, “Scale at a speed beyond your company’s capabilities and you can end up in over your head. Scale too slowly and you risk losing momentum and vital opportunities” (2015).⁸⁵ Scaling is a hard process to manage; and, scale-ups, even well-funded ones, need more specialized services through transformation. While Cekirdek is a very successful incubator with very high survival rates, not all start-ups graduating from Cekirdek are big enough to fund their own, decent office in Istanbul. This has been the case also for many other incubator of Turkey. ITU Magnet have opened to help those start-ups trying to scale-up but facing with some execution for business modeling problems. ITU Magnet aims to welcome start-ups that have received angel investment, but still has problems in scaling up to achieve venture capital funding in their A-rounds.

ITU MAGNET constitutes an advantageous and safe ground for a startup to grow after early-stage; thus, it is an ideal place for scale-ups with at least one or more paying customers, a defined business model including a revenue model, target customers, sales channels and specific market strategies, and hungry to scale-up for more customers and growth.

ITU MAGNET offers more than a physical co-working space, bringing high-potential start-ups, investors, accelerators and independent experts together to create a growth-oriented entrepreneurial community. Therefore, ITU MAGNET welcomes any category of potential participants if they are to contribute the diversity of the ITU MAGNET community. Participants may include scale-up startups and entrepreneurs as well as investors, VCs, angel investor networks, private acceleration or incubation programs, experts of software coding, UI/UX design, legal experts, and financial advisors.

While entrepreneurs are benefited from working at the same office with the investors, participating in a selected community of high-growth startups, experienced mentors, experts and other technology focused people, venture-capital investors and domain-experts will find themselves among selected entrepreneurs and get to know entrepreneurs closely by providing mentorships. The mentors, who are composed of ITU MAGNET participants from the most famous venture capital groups, share information and experiences with ITU MAGNET entrepreneurs on certain days and hours.

ITU MAGNET also collects KPI data of the scale-up companies to measure, monitor and track their growth process and support them when needed in cooperation with famous consulting firms. There is a performance review in every 6-months, where the companies are graduated, dismissed or extended in ITU MAGNET. This system motivates and pushes forward the scale-up companies while it gives opportunity to identify and dispose of companies’ weakest points. Furthermore, entrepreneurs and participants of ITU MAGNET can use the advantage of tax exemptions and other rights described in the Technoparks Law of Turkey. This tax advantage provides an additional and major advantage for companies to scale-up.

⁸⁵ Coleman, A. (2015, September 13). The Scale Up Challenges Every Audacious Startup Must Face. Retrieved from <https://www.forbes.com/sites/alisoncoleman/2015/09/13/the-scale-up-challenges-every-audacious-startup-must-face/#ef6115456c35>

ITU GATE International Acceleration Program

As Turkey has a medium-sized market, many technology companies choose to focus on domestic market first, leaving them trapped into a service-oriented hypercompetitive environment in the longer run. This is more so, especially for the B2B start-ups. In order to fuel the long-term growth and developing global competencies, an acceleration program that brings local start-ups at various sizes to global competition had complemented existing service mechanisms and enabled an ultimate vision for global scaling and competitiveness.

With this purpose in mind, ITU ARI Teknokent invested in know-how, business networking and appropriate office infrastructures outside Turkey to establish ITU GATE. ITU GATE is the international accelerator of ITU ARI Teknokent that helps Turkish technology start-ups to access the international markets, providing them the necessary training, mentorship and business networking resources.

Entering the foreign markets doesn't merely mean to have an office abroad; it means to have a good network of people and the specific know-how. ITU ARI Teknokent established its San Francisco office in Galvanize and Chicago office in 1871 to provide ITU GATE companies with easy access to an active ecosystem where they can establish effective business connections in the US market. 1871 and Galvanize are not only co-working spaces but also huge hubs providing seminars, mentorships, and a wide range of network. Besides, being a partner of these entrepreneurial centers providing advantage to ITU ARI Teknokent in terms of flexible capacity and flexible location. Recently, ITU GATE have established its first European office at Cambridge, UK and looking for opportunities in Berlin to expand its reach to continental European opportunities for its start-ups.

The current program begins with a 6 week training a mentoring period in Turkey. At the end of this period, "Demo Day Turkey" is organized and 8 companies qualified to participate the next stage are determined in this event. After that, an US preparation period in Turkey is organized, which aims to make a preliminary study and arrange customer and investor meetings before going to the US. Throughout the whole process, ITU GATE Alumni firms share their experiences about US market.

After the end of period in Turkey, GATE firms take the road to the US. When the firms start their journey in the US, they make meetings that are already organized, using ITU ARI Teknokent's offices as well as attend to roundtables with potential "growth partners". The growth partner model, the innovative new service offered to GATE companies, aims to shorten firms' access to the right resources, accelerate the process of penetrating the US market and the growth process by introducing ITU GATE firms to a broad network of mentors and advisors in the US. These mentors and advisors that we called "growth partners" are chosen after a lot of meetings and a long process of research.

Roundtable sessions with growth partners are organized and performed with a clear focus, a comprehensive agenda, and a strong moderator. For this purpose, a team of ITU ARI Teknokent and related mentors or trainers spend a month with the companies in the US, ensuring that companies match with growth partners in their respective fields in areas such as lead generation, sales, go-to-market, marketing, growth hacking and IPR. If the company and growth partner matches, growth partner supports the company's exponential growth through virtual networking, global sales, and investment process (See Table 2 for ITU GATE statistics). This program, not only brings good start-ups of Istanbul ecosystem to mature in more advanced start-up ecosystems like San Francisco, Silicon Valley and Chicago, but also connects local environment with the talent, investment and know-how of these entrepreneurship ecosystems to further fuel the local growth, as connected companies choose to grow their engineering bases in Istanbul.

| | Cycle 1 | Cycle 2 | Cycle 3 | Cycle 4 |
|--|---------------|------------|---------------|--------------|
| Term | Nov'14-Jan'15 | Jun-Aug'15 | Nov'15-Jan'16 | Apr-May'17 |
| Number of Applications | 125 | 150 | 175 | 110 |
| Pricing Model | Free | Free | Free | Cost Sharing |
| Customer & Partner Meetings | 123 | 194 | 320 | In Progress |
| Acceleration | 20 | 20 | 20 | 25 |
| USA Bootcamp | 9 | 8 | 9 | 9 |

Table 22. ITU GATE Statistics

Conclusion: Entrepreneurship Service Mechanisms by ITU ARI Teknokent

In this paper, we examined new service mechanisms designed and operated by ITU ARI Teknokent that aims providing advanced incubation services. Our case study can both serve as a benchmark example for other technoparks and provide a discussion basics to better understand the capabilities involved in enabling business incubation-based services mechanisms. The experience of ITU ARI Teknokent suggests that copying complex service mechanisms for incubation is impossible, as incubation services are largely dependent on their socio-economic contexts, maturity and needs of available start-ups and resource availability. In all entrepreneurship programs' ITU ARI Teknokent has found specific solutions for local challenges and has implemented its own way of supporting start-ups. In addition, strong and resourceful players like ITU ARI Teknokent can support the emergence of entrepreneurship ecosystems in their context by offering multiple service mechanisms to support various start-ups with different profiles and different resource requirements, connecting its entrepreneurship ecosystem with the global entrepreneurship environment.