MIT REAP
Regional Entrepreneurship Acceleration Program

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Innovation Diplomats

South Korea

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EXECUTIVE SUMMARY

The goal of the innovation diplomats project in South Korea was to discover factors both promoting and hindering innovation and entrepreneurship in the region through a series of interviews with key stakeholders of the local innovation ecosystem.

This report details the findings and recommendations resulting from said interviews. The interviewees consisted of five categories: corporate, entrepreneur, risk capital, university, and government. Each interview offered a unique insight into the innovation ecosystem and shed light on how Korea became a global technological leader in the last couple decades as well as how it may change to be even more conducive to the growth of innovation driven enterprises with the potential to have a global impact.

The end of the report lists several recommendations that may aid in helping the Korean innovation ecosystem become more conducive to growing innovation as found in the various interviews.

INTRODUCTION

BACKGROUND INFORMATION

South Korea has arguably one of the fastest growing economies and technological advancements. From the wrecks and poverty left by Japanese colonialism and the Korean War less than 70 years ago, the country now holds a stake in the global technology sector with corporations like Samsung and Hyundai and has the highest investments in R&D as a proportion of the national budget. My stay in Korea this summer was through a MISTI Korea internship at Korea Institute of Science and Technology, a government funded research center. KIST played a great role in developing key technologies and in turn growing Korea's economy in the post-war era. Now boasting thousands of employees, its model is being used to help other developing nations with a similar research center being built in Vietnam (V-KIST) and frequent seminars with leaders of foreign nations.

The South Korean economy ranks 11th largest in the world despite being a quarter of the size of California. There definitely are several factors conducive to growing innovations. Innovative talent is very easy to find with almost 100,000 STEM graduates each year and exceptionally high level of discipline and material is taught from a young age. Research investments are a very high priority for both the government and corporates and infrastructure ranks highest in the world with a 100% of schools connected to the internet and the nation having an average speed of 28.6Mbit/s. There are around 210,000 and 70,000 patents filed each year.

The entrepreneurial side is slightly less developed with management schools ranking 56th in the world and ease of access of funding and VC

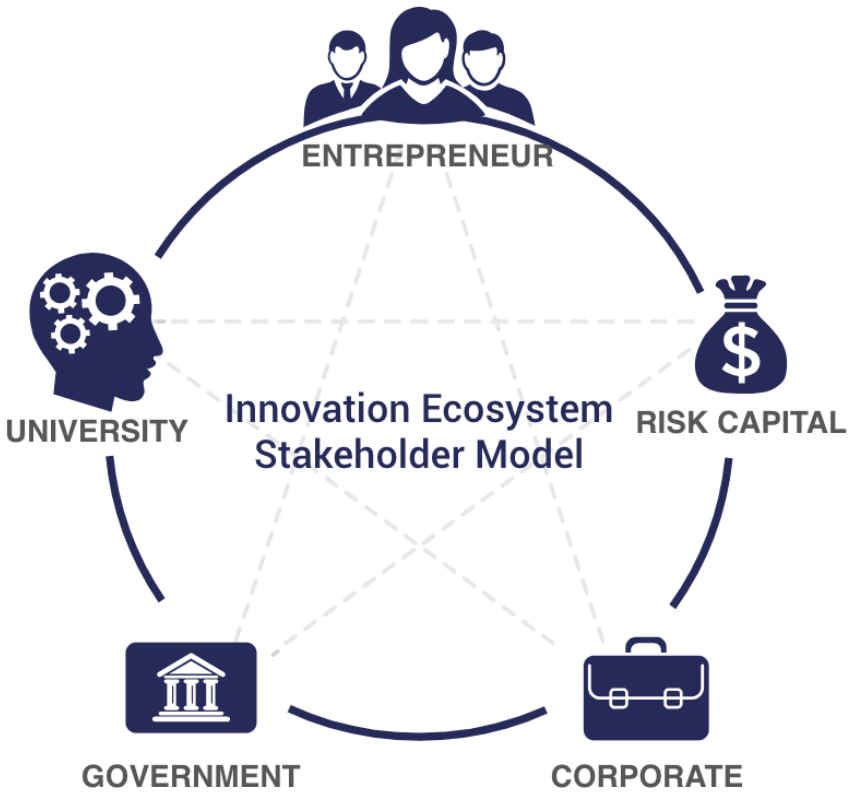
access ranking 115th. Infrastructure again still ranks high with 18 large airports, the KTX trains running at speeds of 305km/h, and a total of 14 million kilometers of highways allowing anyone to travel the nation end to end in a mere two hours on land. Demand for goods and technonlogy is also extremely high with high buyer sophistication and a GDP per Capita of $27,500. All these factors result in a large amount of new businesses registered in the early stage with big corporations like Naver and Kakao exemplifying the successful Korean startup in recent years.

Korea has a very strong culture of discipline and hard work. The education system is extremely rigorous from elementary school where kids prepare for admission into the best middle and high schools, which in turn help them prepare for the college entrance exam in the last year of high school that ultimately determines university admissions. Private supplementary education is an expectation for students and sleep, personal life, and hobbies are often sacrificed. Males will typically serve the two-year mandatory military service in their college years, although the term has recently been reducing. After college, many seek placement at the top corporations, government, and parents always push for jobs in the medical and law sectors. Most jobs will require extra long working hours, something people are used to at this point.

METHODOLOGY

INNOVATION DIPLOMATS FRAMEWORK

The Innovation Diplomats (iDiplomats) program is a part of MIT REAP which allows MIT students on a global summer experience to evaluate and understand a unique innovation ecosystem using the given framework. The framework looks at five key stakeholder categories—corporate, entrepreneur, university, government, and risk capital. Each category is as crucial to the ecosystem as any other, and a lack in any category reveals an inefficiency in the system for innovation.



METHODOLOGY

The project requires interviews with representatives from each category. By hearing first hand experiences in the ecosystem through a variety of interviews, one can gain multiple perspectives and insights on the issue. Each interview lasted from 45 to 80 minutes and I was able to hear each person's experiences and opinions on the given issue. I was able to find most contacts through references from others—whether from the MISTI Korea manager, or previous interviewees.

The questions differed for each category, but they did follow a general trend. The main topics I wanted to hear about were each person's experience being involved in the Korean innovation ecosystem, whether there were extra challenges or benefits, and some insight on what would have been helpful both for them and for the growth of innovation driven enterprises in general. Discussion material from one interview also often carried over to another: for example, if one entrepreneur talked about the lack of corporate support, then I was also able to hear some reasons from the corporate side as well as explanations to gain a fuller perspective.

One aspect that did differ from the standard iDiplomat model was that it was extremely difficult to get in touch with a representative from the Korean government that dealt with innovation and entrepreneurship, so the only government perspective I was able to get was through my internship at Korea Institute of Science and Technology, a government funded research center. The discussions from all the interviews were compiled and organized to get a better understanding of the ecosystem.

KEY FINDINGS

ENTREPRENEUR

The two entrepreneurs interviewed were CEO/Founders of companies at relatively early stages, looking to grow to be global. The first was an aerogel company that had an innovative production method that exponentially cut costs. The product is extremely lightweight and a strong thermal insulator. The lower costs would help uses in a variety of applications from construction to clothing and everyday products. The product has a very diverse range of applications and therefore has the potential to reach a global customer market base. But there also were several key challenges that made the progress difficult. The company's engineers were mostly educated in Korea, where IT talent is easy to find but the managers mostly tended to come from American backgrounds and this cultural gap created inefficiencies in the workplace.

Another struggle was that many established Korean corporates are typically risk averse and unwilling to be the first to adopt new technology. A common prerequisite to adopting innovation when partnering with a corporation would be to list cases of competitors using this technology successfully. The easiest startup, similar to the US, seemed to be in software. The interviewee listed several examples that fit the above criterion, for example, Kakao Taxi, while similar to Uber, relies on existing taxis rather than private cars.

The other company built with IOT products, specifically the CPU that enabled the technology. One key advantage this company found was that wages for engineers and manufacturing factories were significantly lower, cutting costs compared to operating in the US. Many regulations also created ease in testing, and government funds

for startups were relatively common. However, funding in general was a big struggle because the risk capital sector isn't as developed as it is in the US. VCs typically prefer to invest in a later stage startup and money comes often from personal, family, and friends' investments.

The key issues entrepreneurs seemed to struggle with were the difficulty in obtaining early stage funds for ideation, which cuts off many companies with potential from having a product reach the market, and the difficulty in reaching the corporate world with completely innovative ideas. One outcome from these factors is that "entrepreneurship" in Korea often tends to reach more towards SMEs, like small restaurants and stores rather than an investment in the tech sector.

RISK CAPITAL

The agreed notion about Korean Risk Capital is that investors were very risk averse. Banks require very high tangible collateral—a building for example—which most startups can't provide. VCs prefer to invest in a later stage when the company is stabilized and showing signs of definite profitability. Government programs are common but small in amount and there are policies that can lead to punishments for failed investments, which is an obvious risk and expectation to assume when funding startups. A common complaint heard was that to many, the fact that 5 out of 7 investments led to failures rather than the fact that the two became globally competitive.

Most common funding therefore were private. Families of Korean conglomerate corporations are extremely rich and many often have fund managers that invest in a diverse array of risk setting, some of which funds entrepreneurship and innovation. If not from these funds, many startups as stated in the previous section often rely on personal connections for funding.

One interview that revealed something unique was with Idea Bridge Capital, a company that invests in intellectual property. Unlike most others that looked for physical, tangible collateral, this company evaluated intangible intellectual property like patents, copyrights, and trademarks and used them as collateral. The business model would be to buy a patent from an early stage company, then charge a royalty until the company reached a stage, an IPO for example, in which it could afford to buy the intellectual property back. While uncommon in Korea, this company provided around 40 startups with funds to develop the necessary technology otherwise hard to attain with several becoming a global company.

CORPORATE

The corporate world in Korea is one where most young graduates strive to end up in. The top graduating students seek jobs at companies like Samsung and Hyundai and it is not an overstatement to say that these corporations dominate the Korean economy. The opinions heard on the corporate's role in the innovation vary significantly. For some entrepreneurs, attaining corporate partnership was extremely challenging due to a culture of aversion to risk. For others, corporates provided the necessary research funds in grants to get the company up and running, with several labs existing solely funded through corporate funds. One example is Naver Labs, a division of the leading search engine in South Korea, solely focused on developing ambient intelligence technology.

The reluctance to work with smaller companies was in fact confirmed by one of the interviewees, the CEO of KCI, a hygiene chemicals subsidiary of Samyang Corp. He explicitly stated his reluctance to work with Korean startups and universities in the interview, the reason being the Korean education system. As stated in the introduction, the Korean education is heavily exam based and many argue that this produces students who lack diversity of interest, goals, and the

creativity and spontaneity required to lead true innovation. On the other hand, there is an apparent benefit to this as another corporate representative stated that such discipline helps workers collaborate and organize toward achieving a bigger goal.

Considering all factors, the corporate involvement in the innovation ecosystem is mixed. While they do invest significantly in research both in and out of house, the brain drain from the lucrativeness of the corporate world as well as the lack of frequent outside collaboration hinder the growth of innovation driven enterprises.

UNIVERSITY

Innovation output varies significantly per university. The top sought after colleges in South Korea are SKY—Seoul, Korea, and Yonsei Universities. These, in addition to the top STEM university, KAIST, have arguably the highest contribution to the innovation ecosystem. The research process in Korea is similar to the United States. Professors apply for grants and funds, whether from the university, the government, or private companies and they have relative freedom unless the government declares some special priority for research. Commercialization of technology produced through research might not be as common as in the United States, but among the top universities in Korea, this is starting to change with many students gaining interest in entrepreneurship and programs increasingly developing to encourage commercialization.

The Seoul National University professor interviewed also shared similar concerns about the Korean education system in that many students definitely struggle with finding their own projects. The education up to grad school is often cookie cutter, having a predefined path within a certain range. But again, the interviewees were optimistic about the trend, pointing out that this pattern is changing for the better.

GOVERNMENT

The Korean government has the highest investment in R&D as a proportion of the national spending in the world. The fund goes into three places: government funded research centers and labs, research and startup grants, and entrepreneurship accelerators. With the recently inaugurated president, there has been a greater focus on entrepreneurship and many startup funds and help centers have been created.

My internship host was the largest government funded research center in Korea—Korea Institute of Science and Technology (KIST). The research center employs around 3000 people and has many labs within for a diverse array of research. Some key technologies include doping control for the 1988 and 2018 Olympics hosted in Korea, a working moon rover, nanotechnologies and materials research and production.

One thing lacking from the government side was established entrepreneurship programs. While government offices did exist, entrepreneurs at large seemed to only realize benefits from government support in terms of small funds. There could definitely be more in terms of support for entrepreneurs with training.

RECOMMENDATIONS

In all, there seems to exist an optimistic trend in terms of the innovation ecosystem. People are aware of the existing issues and barriers to innovation and entrepreneurship and while there is a cultural issue involved in the root of the problem, interviewees generally agreed improvement is taking place.

The highly stressful and standardized education system is slowly changing in which the colleges are attempting a similar-to-US admissions system with increasing emphasis on essays along with exam scores. A greater encouragement in creative spurts among the youth will definitely help individuals take on innovative pursuits. The diversification will also lead to reducing the strive for positions at the biggest corporations and encourage others to pursue nonconventional paths like creating a startup. A change in the education system will also encourage greater collaboration between the corporate world and the entrepreneurs and universities. All in all, it'll strengthen the bridge between the various stakeholder groups that encourage and foster the innovation ecosystem.

Universities can also do more to encourage entrepreneurship, with greater programs to support startups for both professors and students. The top universities are steering in that direction but other universities will also need to follow suit in order for the full effect. This, however, will also require support from other stakeholders. The government, corporate, and risk capital sectors should be willing to support these startups.

One effective cultural viewpoint shift would be to accept more risk. An interviewee mentioned strong sentiments against failed investments. With government startup funds, it isn't uncommon for a representative

to be called in for a hearing when the number of failed startups rises. If people adopted a more risk accepting culture and point of view with the innovation ecosystem, greater innovation output will result. Many strong ideas don’t reach the product market due to the lack of support for early stage companies and a more risk tolerant culture from other stakeholders for entrepreneurs will definitely aid the growth of innovation driven enterprises.