INNOVATION CENTRE DENMARK

ICDK TEL AVIV

ATTRACTING MULTINATIONAL COMPANIES TO THE INNOVATION ECOSYSTEM

BEST PRACTICES FROM ISRAEL

Ministry of Higher Education and Science Denmark

MINISTRY OF FOREIGN AFFAIRS OF DENMARK

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1. INTRODUCTION

Israel has a history of successfully attracting multinational companies (MNCs) to its innovation ecosystem. Today more than 360 MNCs representing 35 countries have innovation activities in Israel. The MNCs operate through a diverse range of innovation activities. Whereas opening an R&D center and attracting talented software engineers to do innovation in-house used to be the main way of operating in Israel, today 89% of MNCs are looking for enhanced core capabilities through open innovation and external partnerships. For corporates and MNCs external innovation is becoming increasingly important in order to stay competitive, as products and services are getting more and more complex and digital. A prerequisite for staying in the race for new disruptive technologies, corporates and MNCs look towards external partners to keep on track with their technology development and business expansion strategies. To develop all components for new products in-house is simply too expensive and burdensome. Hence, they look for partnerships with startups, universities and incubators to keep up to pace.

Most MNCs today operate through a diversified innovation activity portfolio. Since 2014, there has been a significant increase in the number of open innovation teams being activated by MNCs in Israel. Due to the openness and tightly knit innovation ecosystem, high start-up concentration (6600+) and access to a broad range of technology applications, MNCs are reaping the benefits of doing open innovation in Israel. Thus, interesting models of working with open innovation through partnerships with external stakeholders can be observed in Israel.

In this report we examine the incentives of MNCs to do innovation in Israel. First, we examine the framework conditions that explain why Israel has been successful in attracting MNCs. This includes providing an overview of how the government has provided regulatory measures and is working to strengthen the country´s infrastructure of innovation through various programs. Secondly, we present three case studies on how MNCs from different industries work with different partnerships models to do open innovation successfully. Finally, we summarize key conclusions from the report.

The data for this report has been gathered through interviews with key stakeholders from Israel's Innovation Authority, Start-up Nation Central and selected MNCs that are applying innovative methods for doing open innovation. Furthermore, data on best practices have been collected during the ICDK Tel Aviv Master Class on Corporate innovation held during autumn 2022. Finally, a comprehensive collection of secondary materials on Israel's innovation ecosystem and MNC activities has been composed. The case studies have been carried out mainly through interviews with Heads of Innovation of the selected MNCs who operate through different partnership models.

WHY IS IT INTERESTING FOR DENMARK TO LEARN FROM ISRAEL?

One of the main findings of the 2019 'Peer Review of the Danish R&I System'' by the European Commission is that Denmark has excellent scientific performance, but has shortcomings when it comes to transforming academic ideas into commercialized projects that generate economic outcomes. The report furthermore emphasizes that Denmark's strengths in science could be leveraged more by attracting foreign companies to tap into the existing knowledge pools and that Denmark could improve on attracting MNCs.

These two shortcomings, i.e., commercializing great research ideas and attracting MNCs, are exactly what make the Israeli ecosystem an interesting case to learn from.

With this in mind, there are two aspects that are particularly interesting to understand and learn from. First of all, understanding why Israel has been successful in attracting MNCs. Secondly, to learn from the ways in which MNCs operate in Israel through different methods of open innovation collaborating with start-ups, academic institutions and even competitors. By drawing on best practices from Israel, the aim of this report is to provide inspiration for creating suitable framework conditions for attracting MNCs to Denmark and advice on methods for increasing the innovation capacity amongst Danish corporates.

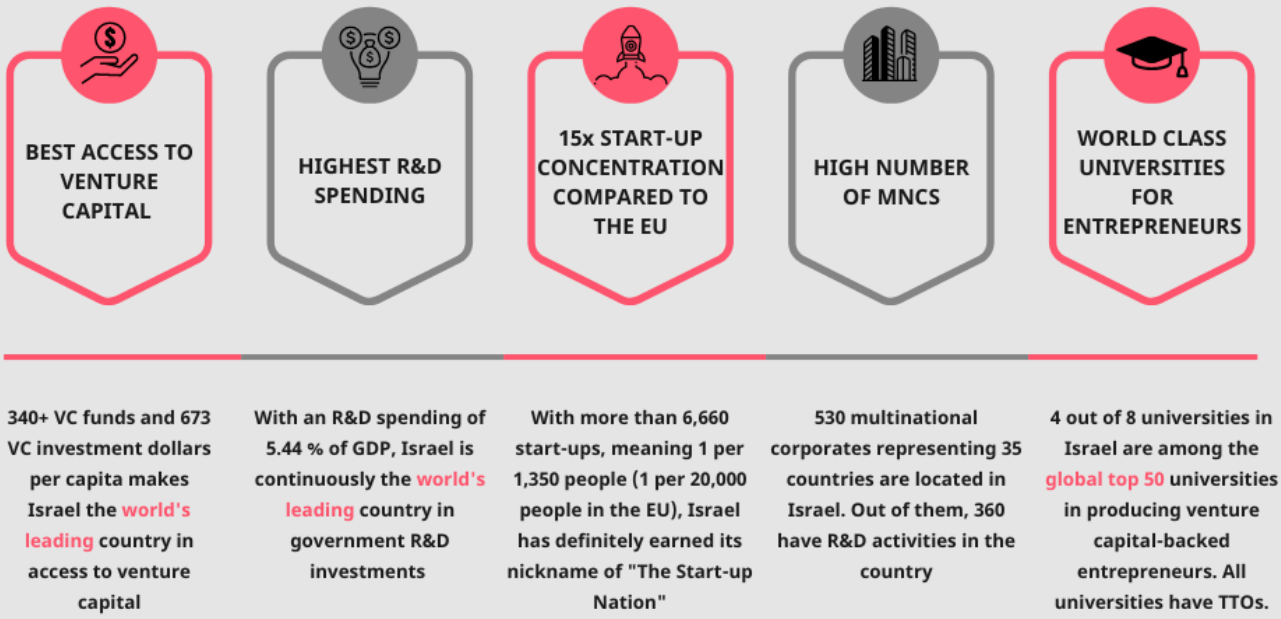
2. FRAMEWORK CONDITIONS: WHY ISRAEL?

In this chapter, we first look at the ecosystem characteristics that attract MNCs to do innovation in Israel. Secondly, we look at the distinct culture of the innovation ecosystem and why it is attractive to MNCs. Finally, we examine how the government is supporting and stimulating the presence of MNCs in Israel.

ECOSYSTEM CHARACTERISTICS: WHAT IS DISTINCTIVE ABOUT ISRAEL'S INNOVATION ECOSYSTEM?

Israel is a unique global innovation hub with a huge concentration of start-ups attracting a lot of foreign MNCs and capital. In 2021 Israeli tech companies raised a record-breaking $27 billion in VC investments[1]. In comparison, Danish start-ups raised DKK 14 billion during 2021. Being a small country with a population of about 9 million people, Israel's innovation capacity is noteworthy. Israel is world-leading in attracting investments with over 340 VC funds and 673 dollars of investments pr. capita. This also explains the very high concentration of start-ups. Currently there are more than 6600 start-ups in Israel. That is 15 times the concentration of start-ups in Europe[2]. Israel also has a small but world-class university sector. It is particularly strong in commercialization of research and 4 out of 8 universities are among the global top 50 in producing capital-backed entrepreneurs. In addition, Israeli TTOs have a remarkable record of accomplishment in terms of generating more revenue from IP sales than any other country except the United States.

Below are some of the main characteristics of the Israeli innovation ecosystem:

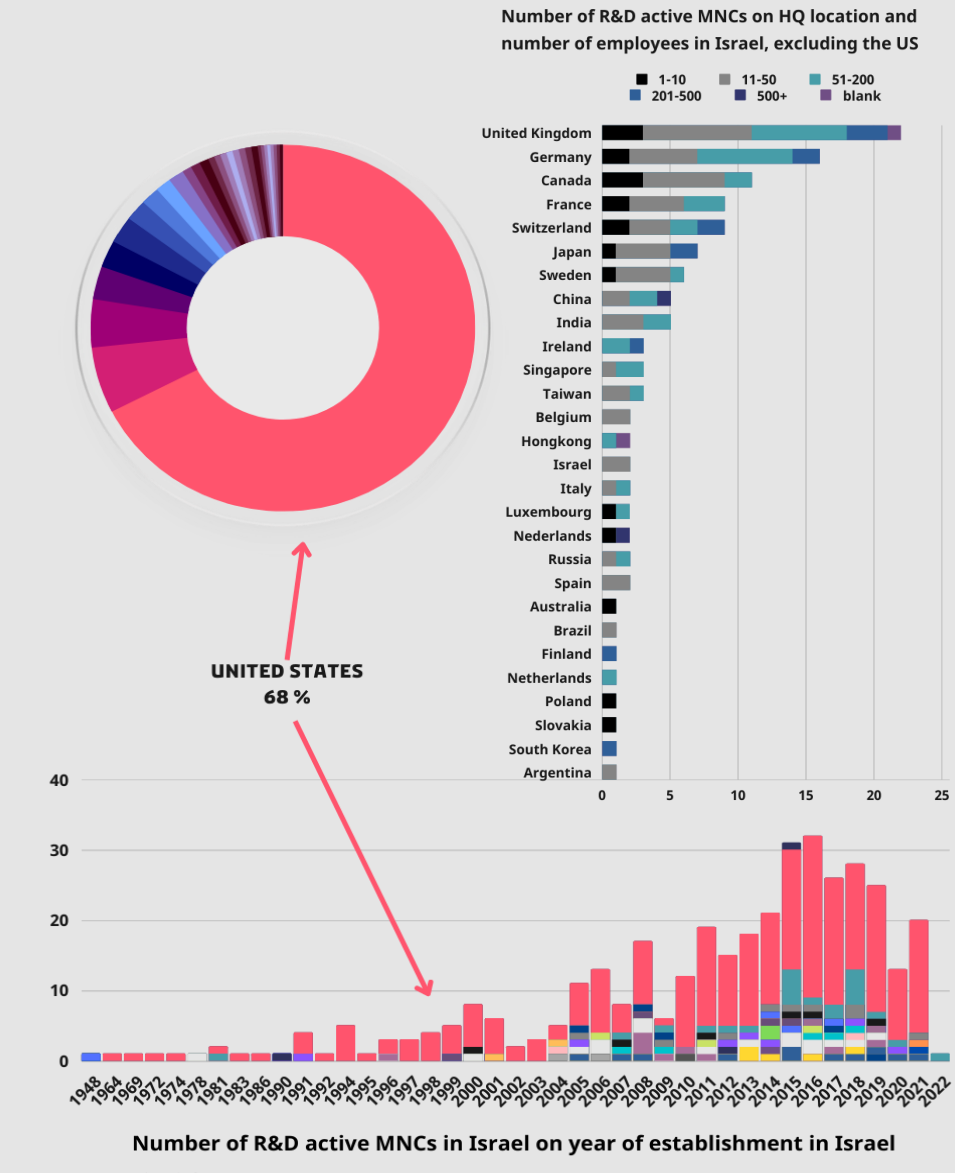


[1] Israel Innovation Authority, *Israeli High-Tech Human Capital Report*, 2022, p. 4.
[2] PWC, Start-Up Nation Central, *The State of Innovation,* 2019.

WHERE DO THE MNCS COME FROM?

Starting from 2010 there has been a spike in MNCs coming to Israel specifically to do innovation activities and reap the benefit of the attractive innovation ecosystem. More than 530 multinationals representing 35 countries are located in Israel and 360 of them are doing innovation activities there.

Looking at the origin of the MNCs (see graphs below), we find that the majority of foreign corporates with innovation activities in Israel have their headquarters in the United States. However, we also see a strong presence of European countries such as the United Kingdom, Germany, France, Switzerland and Sweden. While the MNCs from the United States have been fairly active in Israel since the 1990s, we see that MNCs from other countries first started to settle in Israel in mid-2000s and this trend further increased in 2010s.



Source: Start-up Nation Finder

The MNCs with presence in Israel represent a broad range of sectors. However, a majority of MNCs (over 20%) are from the sector of software & computer services and technology hardware & equipment. Other sectors representing more than a 5% share are telecommunications, information technology, financial services, semiconductors and medical devices.

WHAT ARE THE TAX BENEFITS?

The corporate tax rate in Israel is 23%. Business operations qualifying under the so-called Encouragement of Capital Investments Law are, however, entitled to reduced rates of tax depending upon their location and other conditions. If the company is deemed as a “preferred enterprise” or a “special preferred enterprise”, meaning that they greatly contribute to the Israeli economy (development of productive capacity of the economy, absorption of immigrants, creation of employment opportunities, improvement in the balance of payments etc.), the company will obtain tax benefits. For the “preferred enterprises”, the corporate tax rate is 7.5 % for operations within “development area A”, which is an area with a special priority, and 16 % for operations outside “development area A”.

For the “special preferred enterprises”, the corporate tax rate is 5% for operations within “development area A” and 8 % for operations outside “development area A” for a period of 10 years. After these 10 years, the company will gain the “preferred enterprise” title and receive the tax rates that follow, unless the company has a new investment program that grants the company a new “special preferred enterprise” title.

A company obtains a “preferred technology enterprise” title if it engages in the technology sector, has an aggregate annual revenue of at least ILS 10 billion and fulfills specific requirements for R&D expenditure. If so, the corporate tax rates are 7.5 % for operations within “development area A” and 12% for operations outside “development area A”. Similarly, a “special preferred technology enterprise” regime is also present. The corporate tax rate of 6 % applies here, subject to detailed qualifying rules. For both regimes, the corporate tax rates only apply to the portion of intellectual property (IP) developed in Israel.

Special tax benefits are also given to individual R&D costs, which are deductible for tax purposes even when they represent capital costs.

A DISTINCT INNOVATION CULTURE? A MARKETPLACE FOR OPEN INNOVATION

Apart from the ecosystem characteristics explained above, the MNCs are also in Israel because of a distinct culture with easy access to what they require for their innovation activities.

The Israeli culture of being open towards collaboration and sharing knowledge and ideas is a very important factor. Israel is a geographically small country representing a concentrated network that generates a level of accessibility that is regarded as very distinctive. This means that it is comparably easy and cost-effective to engage with the ecosystem*: Israel often offers faster results and requires smaller teams owing to the more concentrated, networked market and the distinctive execution pace of local teams*[3]*.*

Israel is also a young country with “immigrant roots” and with a high acceptance of failure. According to Regine Shevach, Head of Merck’s Innovative Technologies Enablement Center in Israel*: The Israelis are not afraid to fail, we do not care about failure, we learn from it*. *This is one thing that is very different in Israel from the United States and Europe*.

In the past, most MNCs came to Israel to get access to the great talent pool, in particular engineers. Today most of MNCs come to Israel to tap into one of the world-leading innovation ecosystems and to do open innovation.

> *In the past it was all about our good engineers - and this made Israel a good place to do R&D. But I think today it's all about innovation, all about open innovation. So, there is a lot of startup companies here, a lot of entrepreneurial spirit, a lot of good research and a tech-transfer system that is very established. So if a company wants to do open innovation, Israel is a good place to do it. Because it's very easy for multinationals to interact with the ecosystem. It's simply a small country that is very well connected.* Anya Eldan, former VP of Israel’s Innovation Authority.

[3] PWC, Start-Up Nation Central, *The State of Innovation,* 2019, p. 65.

Precisely o*pen innovation* was a recurring theme of the MNCs when explaining the attractiveness of Israel's innovation context.

The extensive Israeli focus on inter-organizational collaborations, technology transfer, and engagement with the broader external innovation ecosystem to solve corporate challenges paired with a strong, interconnected, and collaborative networking culture were highlighted as significantly enabling characteristics in the Israeli innovation mentality. Additionally, the MNCs highlighted the Israeli ability to break down corporate knowledge silos as a highly favourable characteristic in the pursuit of effectively shortcutting conventional and time-consuming corporate innovation processes. There seems to exist a social consensus that emphasizes deep seeded trust in collaboration in opposition to a more risk averse and protectionist approach to R&D and innovation.

Alongside this, MNCs have access to a significant concentration of high quality research institutions, agile start-ups, and commercially minded Technology Transfer Offices. This places the MNCs in close proxy to knowledge- and technology spill-over that enables the nourishment of corporate innovation and innovation processes contributing to commercial development.

> *The interaction between researchers and entrepreneurs have led to the creation of many start-ups in Israel. At the moment, we see many examples of this within the alternative protein sector that is now raising some of the highest investment in the ecosystem. This type of interaction is also something very unique here in Israel,* Uri Gabai, CEO, Start-Up Nation Policy Institute.

3. WHAT IS THE GOVERNMENT'S ROLE IN ATTRACTING MNCS?

In this chapter, we look at the government's role in attracting MNCs including what type of programs the government has implemented to stimulate MNC presence in the innovation ecosystem. The government has been instrumental in helping Israel's innovation ecosystem to evolve including in attracting MNCs.

In the 1990s, it initiated several programs to enhance the start-up culture. The most important example is likely the famous YOSMA-program (1993) that kick-started the venture capitalist (VC) industry by leveraging public money to attract private investments. The program did this by offering to provide 40% of the capital that VC raised. In its first three years, the Israeli government invested $100 million in Yozma leading to more than 30 foreign-based venture capital firms setting up in Israel. Technology venture capital investments grew from $1 billion in 1999 to approx. $3 billion in 2000. The project is regarded as a rare example of government venture capital success and was instrumental in transforming the country into a global research and development hub often referred to as the 'start-up nation'.

With the development of the start-up nation also came a wave of MNCs establishing in Israel. This happened in different ways. Many of the MNCs that established there did so through acquisitions of start-ups. Large corporates were first buying an Israeli technology start-up and then turning it into an R&D center.

The government is very conscious of the value that MNCs provide in building and maintaining the success of the innovation ecosystem and it has created a number of programs to stimulate this. Israel Innovation Authority (IIA) under the Ministry of Economy, is an independent publicly funded agency in charge of this. IIA invests in research and development of groundbreaking technologies and products. IIA is providing infrastructure and support to stimulate and strengthen the innovation ecosystem. This includes to a large extent attracting MNCs to do innovation activities in Israel.

To facilitate and support the engagement of MNCs, the IIA customizes the framework conditions for MNCs and actively supports the innovative activities financially to enable continuous development of innovation possibilities in the Israeli innovation ecosystem.

> *The presence of multinationals is one of the most important factors to Israel's success of building a world-leading ecosystem. And it cannot be emphasized enough. It's definitely because we're small country far away, and the presence of multinationals always brought new trends, new technologies, taught people how to work in larger corporates, how to build larger corporates. So it's extremely, extremely important*, Anya Eldan, former VP of Israel Innovation Authority.

GOVERNMENT PROGRAMS DIRECTED TOWARDS FOREIGN COMPANIES IN ISRAEL

Through an annual budget of about half a billion euro, the IIA has many different incentive programs for enhancing innovation in Israel and maintaining technological leadership[4].

One of the most instrumental programs in bringing MNCs to Israel and to support early-stage start-ups is the Incubators Program targeting MNCs to invest in and collaborate with start-ups. Through the program, the MNCs become incubators that invest in start-ups in their early stages and provide

[4] The Ecosystem. Tech. People. Inspiration, p. 16

a framework that supports the establishment of the company and the development of ideas into a commercial product. The incubators are chosen in a government tender procedure for a franchise period of 8 years and are deployed around the country. IIA funds up to 85% of R&D costs for no equity.

For every dollar that incubators invest in startups - usually between $700,000 and $2 million - IIA adds six times the amount, equaling a total divide in funding to roughly 85% government, 15% private incubators. The government has no equity or active role in the companies funded, only the financing to make sure they get a strong chance at success.

The funding has to be returned by the company as royalty of sales. So until there are sales, you don't return.

The structure of the programs is unique in two main ways. First the government takes a significant amount of risk with the IIA funding up to 85% of the costs. In comparison, the Danish Innobooster program for start-ups is funding 33%. Secondly, with the incubator programs, IIA creates independent structures that effectively act as early-stage investment companies creating both innovation activities and profit on their own. In this way, the winning incubator programs are also mandated to engage and work with the Israeli innovation ecosystem.

Apart from acting as seed investors, the incubators also play an important role in creating environments and industries that eventually turn into hubs of their own. IIA strives to place the hubs in the periphery of the country outside the conventional tech hubs of Tel Aviv and Herzliya. One example of this it the Kitchen Hub which is an incubator created through a partnership with the Strauss Corporation. It is Israel´s first foodtech incubator based in Ashdod, 40 km. south of Tel Aviv. It succeeded in bringing companies to the region and eventually created a foodtech industry in the country. To date, its portfolio start-ups have raised more than $210 million and include brands like Zero Egg, Yofix probiotics, Aleph farms, Maolac, Mush-Foods, Prevera and more.[5]

In particular, the Incubator Program sets and example worldwide for a public-private platform where MNCs are cultivating start-ups. Between 2006 and 2015, more than 600 startups were accepted into the incubator program, with 10% of them in the pharma industry. About two-thirds of incubators are owned by a consortium of MNCs in Israel and abroad. The rest are owned by venture-capital firms. In many cases, the incubator program is the first investment vehicle for MNCs in Israel such as Takeda, Nielsen and Amgen. Three examples of start-ups that have made great success from the Incubator Program are *CyActive* (incubated at JVP Cyber Labs), acquired by PayPal in 2015 for an estimated $60 million; *Protalix Biotherapeutics* (incubated at Meytav), whose plant-based Elelyso is FDA-approved for treating Gaucher disease; and wearable robotic exoskeleton developer *ReWalk*, incubated at the Technion and now sold worldwide.[6]

IIA also plays a proactive and strategic role in constantly examining where Israel has a relative advantage and a significant growth potential. In recent years, IIA have identified three such areas or technology platforms: Bio-Convergence, Artificial Intelligence and Quantum Computing and have

[5] The Ecosystem. Tech. People. Inspiration, p. 162.
[6] Seedling startups reach full bloom in Israel's incubators - ISRAEL21c

created different programs and initiatives to create the necessary infrastructure needed to help realize the potential including attracting MNCs to do innovation in Israel within these specific fields.

An interesting example of this is the Innovation Labs program. Here, the objective is to connect MNCs to local early-stage start-ups to develop, test and scale-up breakthrough technologies. The program is aimed at assisting entrepreneurs in the preliminary stages of a project, who need unique infrastructures and expertise to prove the feasibility of a technological idea. The assistance is provided through innovation labs operated by the industry's leading corporations via a model of open innovation. IIA will fund 33% of the costs to establish the necessary technological infrastructure (50% in the periphery areas), up to a maximum of ILS 4 million, and will also fund 50% of the lab's ongoing operating expenditures each year up to a maximum of ILS 500,000, without any requirement for financing by the entrepreneur.

An example of this is AION Labs – a unique first-of its-kind alliance of competitors consisting of four leading pharmaceutical companies – AstraZeneca, Merck, Pfizer and Teva – and two leaders in the hi-tech and biotech investment sphere, respectively – Amazon Web Services Inc. (AWS) and Israel Biotech Fund (IBF). The partners have come together with a joint mission of creating and adopting groundbreaking new AI technologies aiming to transform the process of drug discovery and development.

It is an illustrative example of a rare alliance of massive and influential pharma players build through a government tender established by IIA. Behind the funding of the AION Labs project is a strategic government initiative of establishing a niche for Israel within the pharma sector. The strategy is called Bioconvergence where the aim is to try to bring together the capabilities on the engineering side and the mathematical computational side, including artificial intelligence, machine learning, etc., together with classic biology to help revolutionize the way that we discover and develop new drugs in the pharma space.

Israel has a longstanding reputation and track record for early-stage research in the life sciences sector, where nine blockbuster drugs have come out of Israeli academia and research. However, with the exception of Teva Pharmaceuticals, Israel has not managed to build a life science industry encompassing the development of manufacturing and commercialization of drugs. Despite leading academic institutions and thousands of post-docs in the life sciences, the more advanced stages of drug development happen outside of Israel. With the Bioconvergence Strategy, Israel is combining its advantage within AI with drug development and is in this way establishing a strong niche.

In addition to the two programs described in detail above, IIA has a range of programs eligible for MNCs looking to tap into different sectors of the Israel's innovation ecosystem. In the following pages, you will find a non-exhaustive list of these.

Corporate R&D incentive programs

The R&D fund
With an objective of encouraging MNCs to keep investing in R&D activities, the R&D Fund provides financial grants of 20%-50% of approved R&D expenditures for corporates. The IIA furthermore provides an additional support of 10%-25% if R&D activities are located in “favorable development regions”. The company is obligated to pay royalties when a government assisted R&D project results in a commercially successful product.

R&D Collaboration Framework
With an objective of initiating partnerships between MNCs and startups in Israel the IIA supports the Israeli startup with a conditional grant between 20%-50% of the approved development budget. The MNC will receive services such as scouting for possible partners and IP rights in the new projects. To be eligible for the program, the MNC must have annual revenues exceeding $2 billion, significant investment in R&D, and worldwide presence.

Multinational Corporations’ Project Centers in Traditional Industry
This program targets Israeli companies and MNCs which collaborate on an R&D project. While the MNC must have annual sales of more than $2.5 billion and must be from the low or medium technology sector, the Israeli partner must be an Israeli company or academic institution unaffiliated with the MNC. Within this program, the financial support will differ between projects and no royalty payments are mandated for the MNC.

Binational funds
Israel has 5 binational funds together with the US, Canada, South Korea, India and Singapore. These funds are intended to support cooperative projects between companies from these countries. The two countries contribute a predetermined sum to a binational foundation.

Incentive Program for the Encouragement of the Establishment of Project Centers of Multinational Companies in Israel
This program has an objective of encouraging cooperation between Israeli and foreign companies by helping to find a suitable partner and through financial support of up to 50% of the approved project budget.

Industry and academia R&D cooperation

MAGNET

With an objective of enhancing cooperation between academic institutions and industrial companies, this program covers up to 66% of the R&D project budget in an industrial company and up to 80% of the R&D budget in a research institution. A projects under the MAGNET program is approved for a 3-year period with a possibility for extension.

MAGNET Consortia

This program supports the formation of consortia of industrial companies and academic institutions in order to jointly develop generic, precompetitive technologies. The duration of a MAGNET consortium is three to five years. No royalty payments are mandated within this program.

MAGNETON

This program support technology transfer from academia to industry to commercialize IPs. The program is intended for Israeli industrial companies wishing to receive new technologies from academia and for approved academic research groups wishing to conduct new applied research in cooperation with a relevant company. Qualified participants will receive a grant of up to 66% of the approved budget. No royalty payments are mandated.

NOFAR

With an objective of supporting early-stage research with commercial potential prior to MAGNETON eligibility, this program funds 90 % of the approved budget. The target audience is MNCs exploring research-heavy technologies and IP with tangible commercial application. The MNC holds the remaining 10 % of the budget costs and in return get the first right to negotiate commercialization. A NOFAR program is limited to a one-year period.

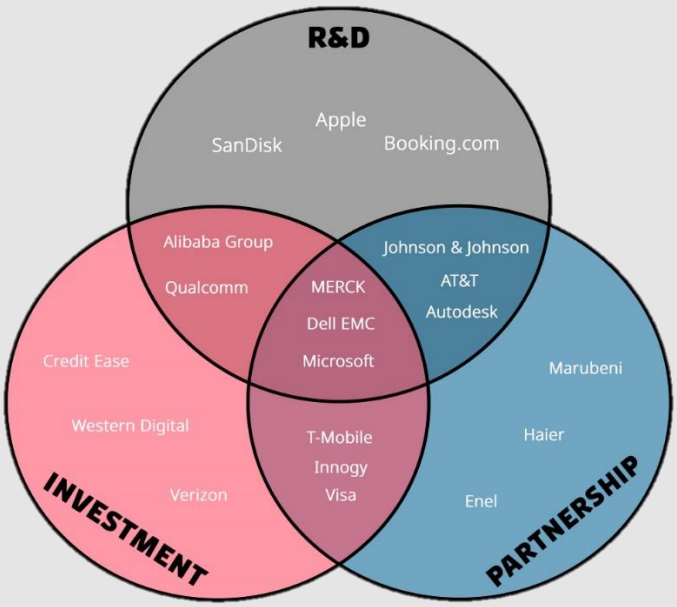
MNC and startup collaboration programs

Innovation Labs
This program seeks to connect Israeli early-stage startups with MNCs to test, develop and scale up breakthrough technologies. The IIA funds up to ILS 4 million in establishment costs, with the possibility for additional funding in ”development areas”. The IIA furthermore funds up to ILS 500.000 in yearly operating costs.

Technological Incubators
The objective of this program is to transform technological ideas in their early, high-risk stages into startup companies capable of raising money and operating on their own. The incubator is operated by a licensee who is selected and approved by the relevant Israel Innovation Authority committee. The licensee invests only 15% of the project budget whereas the state invests the remaining for a period of 2 to 3 years. The financial support from government (approx. $500,000 – $750,000) is to be repaid to the government only upon generation of sales.

4. HOW MNCS DO INNOVATION IN ISRAEL

In this chapter, we look at different methods for doing open innovation and engaging in external partnerships found in Israel. The ways in which MNCs do innovation in Israel can roughly be divided into three different models: an R&D-led model, an investment model and a partnership model[7]. It is a simplistic way of dividing the different operating models and it is important to note that most actively innovating MNCs in Israel often engage through multiple models at once.



Source: 'State of innovation Report" by PwC & Start-up Nation central (2019)

R&D*:* The MNCs operating the R&D-led model of engagement with the Israeli innovation ecosystem tend to have a significant local research and development presence. Their growth is catalysed through the acquisitions of local start-ups and attracting the significant concentration of local tech talents and data science talents.

MNC's practicing this model of engagement: Apple, SanDisk, Booking.com

Investment*:* Investment-led MNCs are those who are primarily focused on allocating capital into local ventures and start-ups with a strategic pursuit of acquiring talent and Intellectual Property, as well as financial gains through IPOs (Initial Public Offering) and potential acquisitions in the later stages. This engagement model is an instrumental tool for MNCs to avoid disruption.

MNC's practicing this model of engagement: Verizon, Western Digital, Credit Ease

[7] PWC, Start-Up Nation Central, *The State of Innovation,* 2019., p. 28

Partnership*:* MNCs engaging through a partnership-led model develop multiple interactions with external innovation stakeholders through commercial agreements, sponsorships, product co-development with e.g., academic institutions, start-ups, government authorities, customers etc.

MNC's practicing this model of engagement: *Haier Group, Enel, Marubeni.*

Diversification-based: There are also examples of MNCs engaging in the Israeli innovation ecosystem through a diversified approach combining the R&D, Investment, and Partnership-led model to enable and engage the strengths of different Israeli innovation-arenas. A diversified engagement emphasizes the acknowledgement that the highest return on investment stems from engaging in a broad range of innovation activities and less about specific institutions, actors or sectors.

MNC's practicing this model of engagement: *Merck Group, Dell EMC, Microsoft.*

The three cases described in the last section of the report are also examples of diversified models of doing innovation with an emphasis on building external partnerships.

WHAT CHALLENGES DO MNCS MEET?

According to a survey done by PWC and Start-Up Nation Central in 2019, one of the main challenges for MNCs is to manage the interface between the innovation activities that they are doing in Israel or in other innovation hubs and the central business units. That includes aligning innovation efforts with the company's business strategy including managing the distance between HQ and Israel. Many reporting levels between the local innovation team and the Group CEO can create uncertainty about mandates and about what the precise innovation objectives are.

The results of innovation are also often not immediate and can be a disincentive for business leaders focusing on profit. Misaligned incentives can ultimately slow down the adoption of innovation. The challenge is to create innovation governance that is somehow part of the core of business, but that still leaves space and autonomy for innovation[8].

[8] PWC, Start-Up Nation Central, *The State of Innovation,* 2019, p. 29.

5. WAYS OF DOING OPEN INNOVATION SUCCESSFULLY: 3 PARTNERSHIP MODELS IN ISRAEL

The three cases examined all show different ways of engaging with the innovation system through different types of partnership models; either partnering with start-ups, academic institutions or other competing large corporations. Each case looks at why MNCs have decided to do innovation in Israel, how they operate and how they try to overcome the challenge of managing the interface between innovation activities and core business.

PARTNERSHIPS WITH START-UPS: THE CASE OF SAP.IO

1. Why doing open innovation in Israel?

SAP is a global software company that runs several innovation programs, both internal and external, under 1 group called SAP.iO. When it comes to R&D, SAP is developing the core products internally, and additional added capabilities are developed by external partners. SAP creates solutions for many types of industries and to many types of functions with the enterprise. To offer complete solutions and to bring new value and services to its clients, SAP relies on external partnerships to deliver the missing functionalities in its products.

SAP.iO Foundries which is part of SAP.iO, is a global network of innovation teams within SAP operating in leading start-up ecosystems including Munich, San Francisco, New York, Berlin, Paris, Singapore, Tokyo, Bangalore, Shanghai, Latin America and Tel Aviv. The network is responsible for building new partnerships with start-ups in rounds seed to B. The Tel Aviv Foundry was established in 2019.

Being locally present in 11 different cities also gives SAP the ability to collaborate with innovation centers being run by SAP clients where they are present. For example, SAP.iO in Tel Aviv is located in a co-working space where they work closely with Pepsico, one of their big clients. The Tel Aviv teams also support current SAP clients in scouting for start-ups and collaborate with corporates that are scouting for the same topics.

SAP.iO's Tel Aviv team describes the Israeli innovation system as very open. In general, there is great will to collaborate and to share contacts and information. For example, recently, the leadership of SAP consumer industries group came to Israel to meet with the innovation teams of their clients. These types of meetings would have been much more complicated to set-up in other locations, but in Israel these kind of meetings are relatively easy to set.

Our approach is to leverage Israel´s unique strength of having multinationals doing different types of innovation in Israel, and collaborate with them in order to give value to our start-ups. Many of the MNCs are also SAP clients, which makes it a win-win for us, for the startups and for our clients, says Lior Weizman, Director at SAP.iO. Tel Aviv.

2. How does SAP.iO operate within the Israeli innovation ecosystem:

SAP.iO works in a very structured manner: Each team is running two start-up programs each year within different topics. It could for example be a program focused on solutions that will enrich SAP's Supply Chain solutions, and a specific need in that program will be to find a startup to enrich

SAP's warehouse management solution. Each team scouts globally to find the right match for establishing new startups and partnerships. That means that the team in Tel Aviv is not working only with Israeli start-ups.

After selecting 5-10 start-ups that can become SAP partners, they go through a 3-month program with the aim of building a long-term official partnership with SAP. It includes three main elements:

- Integrating the product of the start-up with SAP platforms
- Signing a partnership agreement
- Create joint sales material

What is different in SAP.iO's way of working is that it is not scouting to buy or invest in start-ups, but instead to do business together with the start-up in order to build joint solutions that jointly go-to-market with the start-ups. The start-up that joins the SAP program will stay an independent company. In order to bring value, SAP work together to identify potential clients and create a joint sales platform and strategy.

3. How does SAP.iO ensure that their innovation activities are anchored in core business?

The team is closely connected to internal SAP stakeholders for each of the topics. Together with a SAP product developing team, the SAP.iO team identifies so-called 'white spaces' or innovation gaps that they want to address through partnerships with start-ups. SAP.iO never initiates a new program before they have the SAP stakeholders committed to working with the start-up for the 3-month duration of the program.

PARTNERSHIP AMONG COMPETITORS: THE CASE OF AION LABS

1. Why doing open innovation in Israel?

AION Labs is a newly created challenge-based company creation innovation lab that seeks to enhance the use of AI within the pharma industry. AION Labs alliance includes four pharma companies (AstraZeneca, Merck, Pfizer and Teva), one tech company (Amazon Web Services), one venture capital firm (Israel Biotech Fund) and a strategic partner (BioMedX) with support of IIA. For Pfizer and AstraZeneca, it is their first R&D investment in Israel. The Lab was established after winning a government tender as part of the Bioconvergence Strategy of the Israeli government to propel the health tech industry in Israel.

AION Labs benefits from being located in Israel through the advanced healthcare sector. The sector is advanced in its use of digitalization and electronic medical records and therefore the health data is of high quality. Also, Israel has great universities, research, and talent in both life sciences and in computer sciences. While AION Labs scout for talent globally, it is a clear advantage to be

located near the technological know-how, specifically in the AI and machine learning areas, as the competition for talent is very high. AION Labs furthermore emphasizes Israel as a natural place to gather competitors in collaboration due to the open innovation culture. Finally, the support from Israeli government under the IIA is instrumental. According to Mati Gill, CEO AION Labs: *It helps to de-risk, not just from the financial side, but more from the foundational standpoint that the government is supportive of your endeavors.*

2. How does AION LAbs operate within the Israeli innovation ecosystem:

AION Labs work swith specific challenges identified by at least two of their equity partners: AstraZeneca, Merck, Pfizer, Teva and IBF. The partners know how to solve the issues from a life science standpoint, have the right proprietary data to be able to help build and train AI models, and can validate the products. But they lack the best technological expertise in-house.

When a challenge has been selected, talented entrepreneurs and researchers are identified with the objective to create a fully functional startup to deliver on the specific challenge. Here AION Labs collaborates with universities, NGOs, and other relevant entities of the ecosystem to spread the word to as many suitable candidates as possible in Israel and abroad. These could be research teams from universities, an early stage start-up with a promising solution, or it could be just entrepreneur(s) with the right background that have a technologically based concept on how to solve the challenge. These teams are selected by the pharma partners that have decided to invested in this specific challenge in order to improve future collaboration.

The teams are then supported, guided and mentored by all partners as well as AION Labs for growth and success for a two-year period. The goal of AION Labs is to generate on average five start-ups per year for a period of five to eight years. When a fully functional solution to the challenge is developed and the new start-up company is formed, the AION Labs partners do not get IP rights, but rather take equity in the start-ups in exchange for their investment. The incentive for the MNCs, when not obtaining IP rights, is to gain knowledge of disruptive innovation while still being part of the entire development process from ideation to commercialization. AION Labs also works closely together with the Israeli government through IIA. Once approved by the government, the startups can receive funding quite similar to what other incubators do, meaning close to 50 % of total direct investments (remaining comes from AION Labs and partners) for up to four years. The government does not take equity and the money does not need to be returned before sales incur.

3. How does AION Labs ensure that their innovation activities are anchored in core business?

The challenges put forth must be identified and selected by at least two of the four pharma companies meaning that they must collaborate on the solution. Each collaborating partner must also have a champion within their own R&D department that is fully behind the challenge, the idea and the team selected by the pharma companies to solve the challenge. During the process, these champions will help select the startup team and help the startup grow and succeed.

PARTNERSHIP WITH ACADEMIA: THE CASE OF MERCK

1. Why doing open innovation in Israel?

MERCK is a German science and technology corporation that operates within the Life Science, Electronics and Healthcare industries. MERCK has been active in Israel since the 1970's and currently has six representations across its three business sectors; Life science, Electronics, and Healthcare.

MERCK is pushing its R&D agenda in Israel because of the concentration of high quality of research that is continuously produced here as well as the willingness of the academic institutions to collaborate with MNCs like MERCK.

When engaging with a highly diversified plethora of R&D activities, MERCK highlighted that one of the strengths about Israeli start-up projects is their natural inclination to set the prices of acquisitions lower than other innovation ecosystems in the world: *Years ago start-ups in Israel might demand $300.000 to be acquired, whereas the exact same start-up would easily demand $3.000.000 when located in the United States*, says Regine Shevach, who is also Country Speaker for Merck in Israel and Managing Director of Merck activities in Israel in Electronics.

This important metric fundamentally gives the MNC more value and when involved in research of an approximately equally advanced level. In this case Israel is simply a better business deal.

However, the most important factor according to MERCK is that the Israeli ecosystem is highly interconnected and the organizations are actively opening up their innovation processes to expediate innovation. The Israelis are mentality rooted in connecting and collaborating with one another and this speeds up the innovation processes because there is less secrecy impairing collaborative innovation processes.

In addition to the characteristics described above, the IIA, is always willing to support MERCK's ideas in developing new and innovative formats to drive innovation in Israel. This collaboration is a mutually beneficial relation where programs are partially funded by the government, thus lowering the risk for MNCs in general, while simultaneously increasing innovations in Israel, one of the bigger factor in its national exports.

2. How does MERCK operate within the Israeli innovation ecosystem:

MERCK is very active in engaging with academia and within the Israeli ecosystem. Every year the company hosts pitching days at leading universities, in collaboration with TTO's from Weizmann Institute, The Hebrew University, The Technion in Haifa, The Be'er Sheba University, Bar Illan University, and Tel Aviv University. Here, a series of pitches from researchers investigating issues that could potentially innovate MERCK's offerings or technologies are invited. If MERCK finds a research project with significant innovative potential, MERCK will initiate negotiations on providing a research grant to the project. It is a pure research grant with no equity involved. Upon the agreement with the TTO, MERCK establishes a steering committee to make sure the research is heading in a direction that is beneficial for MERCK. If the project proves to be viable and valuable for

MERCK and if a spin-off company is established, then further negotiations on a potential acquisition or on providing equity could be initiated. This method exposes MERCK to the newest research and encourages sourcing relevant innovative research.

In 2015, MERCK acquired the company c Qlight Nanotech that was a spin-out from Yissum - the TTO at Hebrew University of Jerusalem. This was an example of the direct collaboration with academia where MERCK establish a research company where a group of researchers are developing liquid crystal display materials that improve colour impression and energy efficiency in modern displays, as well as materials for the ever developing and growing electronics industry.

Also outside academia, MERCK has significant representation in the life science field, located in Rehovot and Jerusalem and engaged in commercial operations, R&D activities, and production. Another team, in the area of electronics is located at INTEL while an additional research lab is located at the campus of Hebrew University in Jerusalem (Working in advanced material for semi conductors).

MERCK's healthcare presence is split in between Herzliya where commercial operations are placed and Yavne where healthcare research is conducted. In this are the company has extensive collaborations with multiple hospitals within Israel whom we provide with biological materials for research in cancer treatment.

On top of this significant presence, Merck has established in Israel three incubator programs. The first was established as a private incubator for healthcare research, in 2012, providing facilities, finance, HR, and legal support in order to optimize the environment for start-ups to innovate.

The second incubator was established in 2019 in collaboration with IIA. For innovations in the area of electronics and semiconductors.

The Third incubator was established in late 2020, also in collaboration with IIA and is the AION-Labs described in the case above.

3. How does MERCK ensure that their innovation activities are anchored in core business?

When a research project receives funding from Merck, an investment committee is established and assigned to the project to ensure that the research is moving in the general direction of commercial development potential for Merck's product portfolio, i.e., the researchers are assisted by Merck towards specific research goals. The investment committee is connected to Merck's department of Strategy & Transformation to ensure strategic alignment of the investments.

6. CONCLUDING REMARKS

Developing the right framework conditions for attracting MNCs is a complex matter with many aspects to consider. In this report, we have illuminated best practices from Israel in creating and maintaining an ecosystem that is attractive to MNCs. An ecosystem where MNCs have easy access to what they require to stay innovative and competitive. Here, the government's role in creating incentives and funding platforms for MNCs to tap into the ecosystem and create open, collaborative partnerships with start-ups, industry competitors and academic institutions is particularly interesting. Furthermore, the report draws on learnings from the ways in which the MNCs tap into the ecosystem in Israel to exemplify ways of doing open innovation successfully. This includes establishing mutually beneficial and committing ties with academia for gaining continuous exposure to the newest R&D, setting up structure for creating partnerships with start-ups and working proactively with ecosystem stakeholders including government actors to identify competitive niche areas of innovation.

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