



## The German Mittelstand and the Israeli Startup Ecosystem

### Tapping Israel's Innovative Potential

#### German Small-to-medium-sized enterprises (SMEs) and their need for external innovation

Small-to-medium-sized enterprises, known in Germany as the “Mittelstand”, represent 99 % of all German companies. Their top-quality products and services as well as a strong innovation culture have earned universal acclaim.

The ability to innovate can be sourced internally or externally. German SMEs are best advised not to limit their innovative capacity to internal sources, as global competition is fiercer than ever, with companies innovating at an increasingly fast pace. In addition, “disruptive” technologies – such as robotics, autonomous driving or 3D-printing – present a growing threat to traditional industries. Large corporations worldwide have already begun accessing external research and development (R & D) sources. While Mittelstand companies possess fewer resources, the results of our study strongly suggest that they too can benefit from externalizing R & D processes to remain cutting-edge and continue to thrive.

#### Israel's innovative capacity

Israel has a population of 8.5 million and a per capita GDP of roughly € 34,000. In 2016, the economy expanded by approximately 3 %. The country has built a reputation as a “startup nation”. In 2015, Israeli high-tech exits (through M & A or IPO) exceeded US\$ 9 billion, a 16 % increase from the year before. More than 320 multinational corporations are engaged in R & D activities in Israel, including a number of large German corporations, particularly in tech-driven industries. With 5,000–7,000 startups, Israel boasts the highest density of startups in the world, demonstrating its innovative capacity in a diversified “ecosystem” that consists of six key areas:

- 1. The armed forces:** Israeli defense industries, which have traditionally focused on components, electronics, electro-optics, avionics and other systems, have given high-tech industries such as security, electronics, and computer technology an edge in civilian spin-offs.

2. **Universities:** Israel's acclaimed academic community and local innovation ecosystem are strongly synergetic, with a world-leading ratio of 135 highly skilled engineers per 10,000 overall workers.
3. **Public authorities:** The Israel Innovation Authority (IIA), tasked with government oversight of industrial R & D and providing funding and guidance for early-stage startups, had a budget of roughly € 350 million in 2015/2016.
4. **Subsidiaries and R & D labs of multinational corporations:** Many global tech companies have subsidiaries or R & D centers in Israel, including Intel, Microsoft, Google and Facebook. Some 39 % of Israeli high-tech employees work in the R & D departments of multinationals.
5. **Venture capital (VC) funds:** This market is especially vibrant, with VC-backed deals reaching a whopping € 2.4 billion in 2015. Currently, the market comprises 70 active foreign and Israeli funds. In recent years, several top-tier U.S. and European VC funds have opened offices in Israel.
6. **Incubators and accelerators:** The dramatic growth of Israeli startups in the high-tech market, fueled by massive investment capital, yielded an all-time high number of incubators, accelerators and mentorship programs in the country in 2015.

## Methodology

Our goal is to help Mittelstand companies understand and benefit from Israel's startup landscape by analyzing the experience and practices of other SMEs currently engaging in external R & D and open innovation in Israel. We have drawn upon roughly 60 interviews conducted in Israel and Germany in 2016, of which 23 were with German SMEs. Fifteen of those companies are pursuing or already doing business in Israel. The remaining interviews were with representatives of other companies active in Israel, key personnel at Israeli startups, venture capital firms, angel investors, universities, accelerators and regulators, and supporting government agencies and NGOs.

## Key findings

### 1. Low engagement propensity among Mittelstand companies

Despite the interview results, statistics show that German Mittelstand companies, overall, have displayed a comparatively low level of engagement in the Israeli innovation ecosystem. Unlike many German multinationals and US corporations and SMEs, relatively few German SMEs have chosen to pursue R & D activities in Israel. The primary reasons cited are: (1) General reluctance to outsource R & D, (2) Perceptions among sales-driven companies that the Israeli market is too small, (3) Safety concerns due to the political situation, and (4) Fear of losing Arab clients.

### 2. Sales are the key factor in determining market entry

As indicated by the interview results, the above factors have not deterred all German SMEs. The major criterion for deciding whether to engage in the Israeli market is sales-driven. Mittelstand companies that have followed this approach in Israel – especially in the machinery, healthcare and software sectors – have found that the country offers an extremely inviting business environment.

### 3. A positive outlook on doing business in Israel

German companies generally have a positive perception of the Israeli business landscape and its innovation ecosystem. The overall response from interviewees who have engaged with Israel was highly positive, and even those companies that have yet to engage expressed openness to doing business in the country and awareness of the high-quality innovation and technology opportunities.

### 4. None-impeding barriers

Although some interviewees identified one or more of the above-listed barriers to market entry in Israel, none can be considered a “deal-breaker”. This is because none of the expressed concerns, or others mentioned – such as possible intellectual property (IP) infringement or cyber security issues – factored into actual decision-making.

## 5. The most common engagement mode is the “opportunistic” approach

Most Mittelstand companies that engage with Israel favor “opportunistic” exposure. “Opportunistic” is meant here in the sense that, upon pursuing sales activities, the companies remain poised to take advantage of new options or opportunities as they present themselves, including R & D-related engagement modes. The proactive orientation of many Israeli companies further encourages “opportunism”, as demonstrated by the fact that a majority of the companies we interviewed were approached by Israeli counterparts looking for cooperation partners.

## Verticals/industrial sectors

We have identified four high-tech verticals that merit particular examination by Mittelstand companies, chosen based on a mapping of their innovation needs and respective Israeli offerings.

### 1. Automotive

The Israeli automotive sector is comprised of a traditional and an innovative segment, with renowned German corporations active in both. The traditional segment is mechanical and machinery-oriented, and includes products the Israeli industry excels in, such as powertrains, steering brackets, springs and headrests.

The innovative segment features breakthroughs in specialized materials, advanced electronics and communication systems, driver awareness systems, automotive IT and security. While Israel does not engage in large-scale vehicle manufacturing, there are over 300 Israeli companies operating in the automotive industry, of which about half are technology-oriented. The innovative segment is rapidly growing. Innovations can be divided into five categories: (1) Electric vehicles and batteries, (2) Data, connectivity and analytics, (3) Ride-sharing and smart-city technologies, (4) Alternative fuels, and (5) Cyber security.

The number and magnitude of acquisitions (M & A) and initial public offerings (IPO) in recent years are indicative of this vertical’s strength. Mobileye (a global leader in autonomous cars) raised € 733 million on the NASDAQ stock exchange in 2014. In March 2017, the

company was acquired by Intel for US\$ 15 billion, the biggest-ever acquisition of an Israeli tech company.

### 2. Semiconductors

This industry consists of three subsectors in Israel: (1) Memory and storage video, (2) Image and audio, and (3) Communications.

The Israeli semiconductor industry comes with 161 companies that employ more than 20,000 people and generate around € 5 billion in annual revenue. Many Tier-1 semiconductor companies have R & D centers in Israel, including Motorola and Intel, the latter being the largest Israeli tech employer and having invested more than € 9 billion in the country. Several established Israeli companies operate in related markets. Major exits in 2015 included Annapurna Labs, acquired by Amazon for € 331 million, and Pebbles Interfaces, acquired by Facebook for € 40 million. In terms of financing, Israeli semiconductor companies raised € 151 million in 2015.

There is an obvious potential in this vertical: While Germany’s electronics industry generated revenues of almost € 180 billion in 2015 and continues to grow, not least by aggressively investing in R & D, Israel has one of the largest semiconductor sectors outside of the US. Yet there is currently no notable German activity in that market. Video, imaging and audio are all major components of the digitalization transformation, with most Mittelstand companies merely beginning this transformation. The Israeli business landscape thus offers a potentially lucrative entry point for these companies.

### 3. Internet of Things (IoT) and Industry 4.0

Internet of Things (IoT) refers to the concept of taking objects, adding sensing and processing capabilities, and connecting them to the Internet. This enables the user to collect information and control processes remotely.

Industry 4.0 focuses on the end-to-end digitization of all physical assets and the integration of value chain participants into digital ecosystems. The Israeli IoT sector accounts for roughly 330 active startups, representing around 5 % of all startups in Israel. Most Israeli IoT companies operate in the healthcare, life sciences or cyber security sectors. In 2015, Israel boasted Europe’s largest number of IoT investments.

Industry 4.0 and IoT are crucial innovation areas for German manufacturers, with opportunities particularly in the platform and components categories, where many Israeli companies are still in the early stages of development.

#### 4. Cyber Technology

The cyber vertical includes technologies, processes and practices designed to protect digital networks, computers, programs and data from attack, damage or unauthorized access. The Israeli cyber security industry exports more than € 3 billion of goods and services each year, accounting for an estimated 7 % of global sales. The number of cyber security companies in Israel has more than doubled over the last five years, to 450. Investment in Israel's cyber security industry has increased sharply in recent years, with companies such as McAfee, Cisco Systems and Microsoft acquiring Israeli companies and establishing local R & D presences.

Notable Israeli cyber security companies include Check Point Software Systems, which raised US\$ 44 million in its IPO, and Imperva, which raised € 70 million. Recent major M & A involving Israeli cyber security companies include Microsoft's acquisition of Aorato for € 184 million and Palo Alto Networks' acquisition of Cyvera for more than € 163 million. Several German multinationals are also active in this field. For instance, Volkswagen together with three leading Israeli experts established an automotive cyber security company, CYMOTIVE Technologies, in 2016; and Telekom Innovation Laboratories was established in 2004 at Ben-Gurion University.

#### Engagement modes

There is no single optimum method for gaining and integrating external R & D expertise. The resources and capabilities of large corporations enable them to employ different engagement modes simultaneously. Mittelstand companies, by contrast, are inclined to take a step-by-step approach. We therefore identify five generally applicable modes of R & D engagement (ranked by their level of commitment from low to high):

#### Engagement Mode 1 – “Opportunistic” exposure

“Opportunistic”, or spontaneous exposure, as mentioned above, is a process whereby a given company enters the market through activities other than R & D (e. g., distribution or production), building trust with local actors and developing a greater understanding of local opportunities. With this knowledge, the company puts itself in a position to seize R & D-related opportunities at a later stage.

Advantages of the “opportunistic” approach include solid feedback from target markets, rapid market access, development of stronger relationships and low costs. Disadvantages include a potentially slow process and a lack of dedicated personnel seeking R & D opportunities.

This engagement mode was the most common among the interviewed companies, especially those that employ a sales-driven internationalization approach. These companies were persuaded by proactive partners to cooperate locally and, in several instances, the interaction led to successful R & D engagement.

#### Engagement Mode 2 – Scouting

Scouting is the gathering of information about a particular market – its trends, technologies and startups. It can involve general research or be focused on a specific technological area. Scouting can be carried out in three ways: (1) Through external, local market specialists (low engagement), (2) Through local employees, setting up an office or shared space (medium to strong engagement), (3) Sending expat employees to Israel (strong engagement).

The advantages of scouting include a lower cost compared to other engagement modes as well as a greater degree of flexibility. Corporations such as Siemens and Bosch, and some non-German SMEs, employ this method, but surprisingly, given its advantages, no German SME has yet done so.

#### Engagement Mode 3 – Accelerators and incubators

An incubator is an entity that serves as a catalyst for national economic development. Incubators help startup companies by providing services such as management training or office space, mentoring,

accounting and legal consulting. Currently, there are 24 incubators in Israel. Initially owned by the Israeli Innovation Authority, over the past 15 years their operations have been privatized.

Accelerators support early-stage, growth-driven startups through education, mentorship and access to data. “Accelerator” is a generic name for several types of institutions, entailing a variety of different benefits and costs for companies. Startups tend to enter accelerators for a fixed time. There are currently between 120 and 150 active or pre-launch accelerators in Israel.

We identify three sub-categories of accelerators, differing in terms of risk, commitment, control and costs:

**1. Generating a partnership with a local accelerator.**

This approach entails lower costs for each partner; however, it offers less control and requires a high level of shared understanding.

**2. Founding an accelerator in Israel.** A German company can establish a wholly-owned local accelerator. This is more expensive, but potentially an excellent way to learn about the Israeli market while maintaining full control of projects. This approach also works well in tandem with the scouting mode.

**3. Founding an incubator.** This involves higher risks and commitment, as the company must invest substantial capital and allocate a workforce for a longer period of time. This model fits companies whose R & D process is longer and requires more funds (e. g., pharmaceutical companies). So far, only Merck Ventures has established its own incubator.

The main advantage of accelerators and incubators is the creation of experimental, fast-paced environments, which can be set up in collaboration with several non-competing companies. The main disadvantage is that considerable resources are needed to build the accelerator/incubator in terms of management, workforce and capital.

## Engagement Mode 4 – Direct R & D engagement

R & D can be undertaken through strategic alliances or by establishing a local R & D lab:

**1. Partnership and strategic alliances with a local partner.** Here, a given company relies heavily on its partner. This entails a technology exchange that enhances the company’s expertise, provides access to local know-how and high-quality personnel, and reduces investment costs. There is a sacrifice of direct control, however, and the possibility of diverging objectives. Identifying the right partner also can be challenging.

**2. Establishment of a local R & D lab.** In this mode, companies enter the Israeli market via R & D centers. Typically, these are acquired through the purchase of an Israeli company, though some companies have chosen to establish an Israeli R & D branch from scratch. This engagement mode provides a high level of control but also requires a significant investment. Due to the investment factor, it is mainly used by corporations such as Deutsche Telekom and Merck, but also by some German SMEs, such as Herrmann Ultraschalltechnik. Overall, the data is quite promising for this approach.

## Engagement Mode 5 – Mergers and acquisitions

Acquisitions are one of the most popular engagement modes in the Israeli ecosystem. Of the 276 multinationals active in Israel, 103 have made at least one M & A investment in the past five years. In many cases, the acquisition became the foundation for an R & D center. The mode’s success is also reflected in the total capital inflow to Israel, peaking at € 6.7 billion in 2015, and boasting a compound annual growth rate of 15 % between 2011 and 2015.

While this mode involves a relatively high risk and requires substantial financial means, German Mittelstand companies Adva Optical and Software AG have employed it successfully. Adva, for instance, acquired a small Israeli company after four years of collaboration and transformed it into its local R & D center. Software AG, among other transactions, purchased 80 % of SPL, a software specialist in the banking and insurance sectors, at a value of € 46.3 million.

## Practical recommendations

Based on our extensive research, we recommend the following steps for initial market entry by Mittelstand companies:

### 1. Conduct preliminary research on Israel and its capabilities

Despite widespread and growing interest in the Israeli startup scene, most Mittelstand firms have not yet taken advantage of this area's immense business potential. The following preliminary research steps are useful:

#### a. Visit Israel on a fact-finding mission

Many German delegations come to Israel each year to learn about the local innovation ecosystem. We encourage tailor-made junkets during an exhibition or standalone visits, which can pave the way for B2B opportunities and foster meetings with other German companies active in Israel.

#### b. Contact German companies already doing business in Israel

In most verticals, German companies are present in Israel. These include several multinationals, but also Mittelstand companies such as Software AG, Beckhoff and Pilz, which have expressed willingness to provide information and share their experiences.

#### c. Contact leading Israeli companies in the vertical your company operates in

Israel has several world-class companies such as Mobileye, in the automotive sector, and Check Point, the cyber security company that invented the firewall. These companies can provide valuable information, especially on leading trends and specific innovations.

#### d. Contact support organizations in Israel

A large variety of entities are available to assist German companies in exploring options in Israel. An extensive list can be found in the unabridged version of this survey.

### 2. Build scouting capabilities in Israel

We highly encourage scouting as a way to gain a better understanding of the market. Commencing operations

with the hiring of external local specialists ensures a high degree of flexibility and low costs. If this initial approach yields promising results, we recommend moving on to scouting forms involving greater commitment.

### 3. Direct approach

Direct communication with Israeli companies usually meets with a prompt response. We therefore encourage German companies to select specific Israeli startups that match their priorities and contact them directly. Details of potential targets can be gathered at the Startup Nation Central database.

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