Feature
Tech Inclusion for Excluded Communities
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Ali was a computer science engineer from a Palestinian-Muslim family in Israel who lived far from the country’s geographic and economic center. Ali graduated from a prestigious Israeli academic institution and was hired by a well-established software company in Tel Aviv—an exception in an industry where only a tiny percentage of tech professionals are Arabs. The company that hired Ali had no other Muslim or Palestinian employees. His culture and national identity were unfamiliar and unrecognized in the office, and he felt alone on Muslim holidays, let alone politically charged national ones, such as memorial and independence days. Additionally, working in the center of Israel required him to be on the road for four hours a day because renting an apartment in Tel Aviv was virtually impossible. Ali stayed at the company for less than a year.

Ali’s story is not unique. It captures the underrepresentation of excluded communities in economic growth sectors around the world, particularly in the technology industry. This underrepresentation is but one component of the separation and alienation such communities experience. When their neighborhoods are also geographically segregated, the dominant society sees them at best as destinations for “exotic tourism” and at worst as off-limits because of fear of crime or other perceived threats. Interaction between people from the dominant and excluded societies, when it occurs, revolves around the services that the latter furnish, as waiters, cleaners, construction workers, manual laborers, and other low-level service providers.

Because of the limited interaction between the populations and the institutional violence and excessive policing that members of excluded communities face, potential candidates for high-tech jobs may be discouraged from venturing out for professional purposes or even interviews. Segregation is therefore sustained in an internal loop, wherein the societal conditions maintain the distance between members of excluded communities and the dominant society, even when companies do not actively discriminate.

These social challenges constitute barriers for applicants that go far beyond the obvious professional hurdles. As a result, only few exceptional people from excluded communities choose to study and work in tech professions, and these members often find themselves socially and culturally isolated. The chasm is at times so dramatic that they are unaware of the very existence and relevance of tech professions for them. Having few, if any, examples of people who have achieved professional success, they understandably have a difficult time imagining successfully integrating into these occupations.

Common approaches to workplace diversity, equity, and inclusion identify it with bringing members of the excluded community into the industry’s existing locations. Understanding that such integration cannot be properly achieved without efforts on the part of employers, companies bear the burden of making their teams more “diverse” and “inclusive.” They may appoint chief diversity officers, change their policies to ensure equal employment, make sure that employees go through diversity trainings to avoid implicit biases, establish mentoring programs and diversity task forces, and more. However, such diversity initiatives fail time and again. Even when companies’ efforts are sincere, the individual job seeker faces barriers to entering the corporate tech world, let alone to surviving in
it for any significant period of time. Moreover, even the most well-intended initiatives to integrate members from excluded communities face an inconvenient truth: Not enough candidates apply for their openings, and not all those who apply are qualified.

Companies often offer practical trainings to address the problem of diversity in high tech, acknowledging the disadvantages that members of excluded communities face and trying to level the playing field in terms of expertise and skills. But such trainings often fail in generating mass participation among excluded communities in tech professions. Beyond the professional knowledge and hands-on technical experience that these trainings provide, the fundamental social, ethnic, and economic barriers often remain unaddressed.

Thus, a paradoxical situation arises: On the one hand, certain communities are excluded from high tech and from the social mobility it affords. On the other hand, even when well-meaning companies wish to hire from these communities and implement diversity and inclusion measures that should make doing so possible, the pool of qualified and interested candidates often remains small. Members of the excluded communities remain discouraged from studying or training for these professions and from joining economic growth sectors, particularly high tech.

Tech Inclusion, the model we advance in this article, seeks to untangle this paradox. It takes a sincere look at the social and economic barriers that prevent excluded communities from participating in the tech industry. It suggests that the technology industry can be a driving force for inclusion if we turn the inclusion paradigm on its head, by bringing the industry to the excluded community, instead of trying to bring the excluded community to the industry, while cultivating a supportive environment for both potential candidates and firms.

Tech Inclusion’s focus on high tech stems not only from the prevailing exclusion we see in the industry but also from the great potential it offers: social and economic mobility independent of background; employment in distributed locations and thus in the vicinity of excluded communities; and a new source of employees, especially in tech-centered economies. The existence of a tech center, if it is successful, in an excluded neighborhood or town that employs both local community members and professionals from outside the community may shuffle power relations, break stereotypes, and jump-start social change.

**Tech Inclusion in Israel**

Our model originates in one of the most polarized societies in the world, and its exclusionary high-tech industry. In 2008, Palestinian citizens of Israel comprised 21 percent of Israel’s population but less than 0.5 percent of the professionals employed in high tech, the primary engine of growth in the Israeli economy.2 Needless to say, these employment figures do not encompass the full breadth of the challenges that Palestinian citizens of Israel face in integrating into Israeli-Jewish society: Palestinians and Jews live mostly in separate cities or neighborhoods, state education is ethnically segregated, and language barriers and discrimination in various areas of life persist.

In 2007, Smadar Nehab, coauthor of this article, was in a unique position. As an experienced computer engineer and manager, an Israeli Jew, and an activist with deep ties to the Palestinian community in Israel, she recognized the severe employment inequality that Palestinian STEM (science, technology, engineering, and math) graduates in Israel experienced, as well as the missed opportunity, not to mention the market failure, of the industry. At the time, the Israeli tech industry was already starving for engineering talent, a need that culminated in a labor shortage of more than 18,500 workers in 2019,3 about 6 percent of the workforce of the tech industry. As vice president of engineering at her previous startup, Nehab had had trouble recruiting qualified engineers. When her board requested that she search for engineers overseas, she wondered why she should bother, when Israel already had so many skilled and underemployed Palestinian university graduates. She convinced Yossi Coten, a friend and an expert on logistics management for tech centers in Israel and overseas, to join her.

Meanwhile, Sami Saadi, a Palestinian citizen of Israel who lives in the north of the country, was hoping to start a tech village in the area to help build a sustainable economy in the highly Arab-populated Galilee region. Nehab and Coten partnered with Saadi, and in early 2008 the three founded Tsofen—an NGO whose mission is to connect Palestinian citizens of Israel with the tech industry.

Tsofen stood upon two pillars: its joint Palestinian-Jewish structure and its mission to help bring high-tech operations to the geographical vicinity of the Palestinian population in Israel. The first pillar was essential for the founders: No radical change could be achieved unless Palestinian community members were involved directly and equally. Because of the power imbalance between Jews and Palestinians in Israel, it was also clear that Jewish partners needed to make use of their privileged position and be part of the endeavor. Palestinian-Jewish partnership continued as a fundamental basis for Tsofen.

The second pillar was more challenging, because it required convincing companies to open new operations in Palestinian population centers. Industry professionals expressed reluctance to do so because, they claimed, “Arabs are simply not in the field.” This assertion was partially true. Although at the time thousands of Palestinian Israelis held university degrees in the hard sciences, only a few hundred graduates were employed in high-tech professions, and these graduates ended up working as teachers or in retail, construction, and other professions that did not match their qualifications. Thus, given the slim employment options that would be available to them upon graduating, very few Palestinians chose to study tech-related fields in the first place.

In late 2007, while Tsofen was preparing to launch its operations, the company Galil Software was established in Nazareth, the largest Palestinian city in Israel. It was founded by leading figures from Israel’s venture capital and high-tech communities who shared Tsofen’s vision of spearheading the integration of Israeli Arabs in high tech...
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Beyond the numbers, the reality of a tech company in an Arab city with a majority of Arab employees challenged the notion that Palestinians had no place in the tech industry. It also shattered the paradigm that Palestinians must commute to work in Jewish spaces, and not the opposite.

“When I studied computers, I didn’t believe anybody would hire me,” says Orsan, a Tsofen graduate. “And more than that, I didn’t imagine that my workplace would be in my hometown, Nazareth. I am thrilled to show my son my office in Nazareth, because I know he will be able to aspire for the same or higher.”

The Model

Although we flesh out the Tech Inclusion model through an analysis of Tsofen, it applies more broadly, as we demonstrate through cases elsewhere that involve social entrepreneurship and excluded communities. The model targets the paradox we have identified: Companies from the dominant marketplace want to diversify their workforce but are not exposed to qualified candidates from the excluded communities, while talented young people from excluded communities do not approach professions in the relevant industry because of countervailing sociological and economic factors. As a result, the industry in question, which offers a potential gateway to social and economic mobility, remains closed to these communities.

The Tech Inclusion model untangles this paradox through three fundamental principles. First, it seeks to bring high tech into the excluded community, instead of only bringing individuals from the excluded community into high tech, thereby challenging existing methods of diversity, equity, and inclusion. Second, it commits to full and genuine partnership between members of the dominant and excluded communities. No radical change can be applied without the representation of the excluded community—a rule that is too often overlooked. Third, it seeks to create systemic change via a civil-society actor—an NGO—that propels the entire model forward: activating the local community (including tech candidates and local community stakeholders), tech businesses, and government. The NGO can help map, screen, and train potential candidates; build trust within the community; encourage companies to open their operations in areas where excluded communities are located; and recruit governmental support.

From these three foundational principles, the Tech Inclusion model applies four actionable components: opening high-tech offices in the heart of the excluded community, building capacity through practical training for candidates from the excluded community, raising awareness and building trust among the local community about the opportunities and advantages that tech professions bring for the young generation, and reaching out to government for support in developing the necessary infrastructure and subsidies. These components should be pursued at approximately the same time in order to optimize their impact. Let us consider them in turn.
Component 1: Starting a high-tech operation in the heart of the excluded community

Establishing an operation in the heart of the excluded community based on its members' employment demonstrates the feasibility of tech employment to the community and the industry alike, and thereafter to government and other potential stakeholders. This is the Archimedean point of the model and its most innovative component. It serves as a starting point for full participation of the excluded community in the industry at large.

Establishing a tech operation within an excluded community should be based on three equally important, but not necessarily compatible, foundations: business value, social value, and tech professionalism. The choice of technological focus should be based on a clear identification of a large enough market need, based on a creative mapping of employment needs and employability potential, conducted either by the tech entrepreneurs who establish the operation or by the NGO. The most obvious need is often for software services that don't necessarily require higher education, such as quality assurance (QA) and customer support. At the same time, the technological focus should also showcase the opportunities that high-tech professions open to the excluded community, in terms of better employment and economical mobility. Therefore, focusing on operations that require technical software development capabilities is preferable. Ultimately, the business and social considerations may not conflict in the long run, as starting up the engagement of an excluded community in high tech through low-level software services may eventually lead to participation in more professional and profitable jobs. However, taking both considerations into account is an important baseline.

Here, we must emphasize that the model should not be confused with the familiar offshoring model that seeks lower employment costs elsewhere. Under the Tech Inclusion model, the employees live within the same economic systems and are subject to the same compensation system as that of the dominant society. The reason for locating the workplaces in the vicinity of the excluded community is not to leverage lower salaries but to jump-start the industry within the community.

Companies that pioneer the model will most likely be associated with business leaders who believe in the social and economic value of integrating the underserved community. Since establishing a new tech operation is always difficult, and even more so in a nontypical tech area, such as the neighborhood of the excluded community, these entrepreneurs should also be experienced professionals in the tech business.

Siraj Technologies Ltd., founded by Khader Al-Sheikh and Giora Yaron, offers an excellent example of planting tech in the heart of a community. In mid-2016, Al-Sheikh, a businessman from the Bedouin community in Israel, met with Yaron, one of the founders of the Israeli high-tech industry. The two agreed that something needed to be done to connect the Bedouin community to Israel's booming tech sector. At this stage, when the integration of general Palestinian society in Israel was already accelerating, Bedouin society in Israel was already accelerating, Bedouin society in Israel was already accelerating, Bedouin society in Israel was already accelerating, Bedouin society in Israel was already accelerating, Bedouin society in Israel was already accelerating, Bedouin community in Israel, met with Yaron, one of the founders of the Israeli high-tech industry. The two agreed that something needed to be done to connect the Bedouin community to Israel's booming tech sector. At this stage, when the integration of general Palestinian society in Israel was already accelerating, Bedouin society in Israel was already accelerating.

As Siraj Technologies expanded, the shortage of Bedouin candidates began to impede progress. Thus, a year after Siraj’s launch, the company founded a nonprofit, Siraj NGO, which provides essential

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support to Siraj Technologies, including screening, training, and placement services tailored to the company’s specific needs and technologies. With the help of the NGO, candidates are trained to work with the specific technologies the company uses. The NGO also prepares university and college students for the industry through mentoring, engages high school students with the industry, and promotes high tech within the Bedouin adult community.

The importance of Siraj is clear today. Nearly five years after its establishment, the number of engineers employed at Siraj Technologies has grown to 24, almost half the total number of Bedouin high-tech employees in Israel. Siraj presented the community with a concrete employment opportunity that didn’t exist earlier, one that includes Bedouin role models. To expand on Siraj’s success, the NGO holds community events, such as meetups, hackathons, school visits, and more. The direct engagement with Siraj’s engineers, who could easily be the participants’ cousins or siblings, has an impact no advertising or other PR efforts could.

A 2020 university meetup for Bedouin students illustrates just how attractive a high-tech operation within the vicinity and for the benefit of the excluded community can be, at least in the early stages of a community’s integration into the industry. Two high-tech leaders, one from Siraj and the second from Apple’s Israeli headquarters, headlined the event. At the end, the audience swarmed the Siraj representative to ask about employment opportunities at the company. Despite the lucrative opportunities that Apple represents to many in the world, its attraction for the young Bedouin audience was limited. Siraj represents a realistic and welcoming opportunity—no trivial matter in the first collective steps to inclusion in high tech.

**Component 2: Building capacity through practical training** | Qualified candidates are a prerequisite for starting an industry. By this we mean not only educational qualifications but also knowledge of the industry’s modus operandi. For example, in coding, the speed of development is often more important than its sophistication; team-based solutions and trial-and-error approaches are preferred; and in day-to-day problem-solving, coders favor discussing issues over providing definite answers.

For members of the dominant group, the required soft skills are often acquired through extracurricular activities or participation in social circles outside school and work, such as clubs and programs for young people, and prestigious fraternities. But it is precisely these circles that are very often closed to members of excluded communities.

The capacity-building component of Tech Inclusion addresses this challenge, supplementing college or other formal education with the practical and social know-how needed in the industry. This experience is implemented through company-led boot camps, in which the participating companies define the professional knowledge they need, the methodologies they use, and the traits they value. The boot camp is organized to simulate teamwork, using the company’s methodology to develop a sample project that is related to the company’s product and technology. Ideally, the company will then interview the course graduates and hire some of them. But even if none is hired, participants gain valuable hands-on experience over the course of the boot camp that will help them interview better and talk about technology and real-life programming situations in future interviews. Moreover, once they are hired, this experience helps them acclimate more quickly to their new work environment.

The boot camps can sometimes be compared to on-the-job training (OJT), a practice used by companies that wish to switch technologies and need to bring their staff up to speed. The Tech Inclusion model suggests that trainees should not only get experience with the new technology but also acquire a sense of work norms in the industry. For example, rather than being tested through exams, employees receive feedback on their performance and results achieved on a daily or periodic basis. In actual high-tech work environments, one person’s mistake can mean the failure of an entire project. High-tech employees must learn how to cope with this pressure, which they experience firsthand in the boot camps and OJT.

An NGO founded for these purposes can help map, screen, and train potential candidates. Moreover, it may engage tech companies by inviting their technical leads to run classes and workshops, or by learning the companies’ particular needs and accommodating the training to them.

Per Scholas offers a good example of capacity-building through practical training. Founded in 1995 in the South Bronx and operating in 14 cities across the United States to date, Per Scholas provides tuition-free technology training to unemployed or underemployed adults for careers as IT professionals. It also aims to address the shortage in qualified employees in technology (estimated at one million US jobs in 2020), to advance diversity in technology, and to increase the number of relevant candidates hailing from excluded communities. Per Scholas’ main tool is its customized training courses, which it defines together with partner businesses. The courses are hands-on, practical, and related to well-defined professions in the industry, with an emphasis on coordination with potential hiring companies, teaching according to the companies’ requirements, and using their examples. Over the years, Per Scholas has trained more than 14,000 graduates who have launched careers in tech.

**Component 3: Building an ecosystem and convincing the local community of the relevance of tech professions** | One might think that the local community would be the first to jump on and support the new, lucrative employment opportunities high tech provides, yet this is often not the case. When talking to excluded community members, we often hear statements about how high tech is “for them, not for us.” Such statements reflect the speakers’ alienation from the dominant society and their disbelief that community members would pursue such opportunities.

Excluded community members also lack knowledge and familiarity with tech professions, companies, and relevant role models. Often, members don’t know what high tech is, can’t mention company names, and don’t know anybody working in the industry, whether from within their community or outside it. We spoke with a young female software engineer at one of the leading global software companies, who explained that her parents were worried about her financial future vis-à-vis her sisters, who had stable positions—one as a teacher and the other as a bank teller.

Tech Inclusion stresses that in order to advance mass participation in high-tech professions, community awareness and support are
For this purpose, the pivotal NGO can arrange various events for different community circles, all involving direct technological and social interaction with the industry. For high school students, role models are essential for raising awareness of tech professions. Beyond the part played by the pioneering locally operating companies (from the first component of the model), hackathons hosted by the companies and workshops led by role models from the industry are more convincing than any other educational training. Another effective practice is to take high schoolers on visits to high-tech companies and to meetings with local employees. Such visits help young people imagine themselves joining the industry.

For students as well as graduates of technological programs, appropriate practices can include social networking events focused on technological and employment opportunities, including meet-ups, hackathons, and employment fairs. Such occasions educate students and graduates about existing companies and technologies, leverage role models from the community, and connect prospective candidates with industry leaders. Beyond gaining a deeper sense of the tech field and being inspired by local success stories, attending candidates experience a sense of “discovery” and confidence on such occasions, when they interact for the first time with leading industry figures, and companies that had no prior access to professional candidates from the excluded communities become aware of the talents within them.

Engaging local community leaders is important because of their influence on public opinion. Such engagement can be achieved through one-on-one meetings, inviting them to think tanks where they can connect with influential figures in tech, inviting them to speak at conferences and participate in relevant governmental committees, and through integrating high-tech tracks with the other, more classical business tracks featured during social and business events.

Acceptance by the parents’ generation is another critical step before mass adoption of the new tech professions. In excluded communities, the parents’ generation is typically less exposed to economic and technological changes. At the same time, parents in minority and immigrant communities traditionally play a more dominant role in determining their children’s occupational futures. Thus, informing the parents in the community is critical but may be more challenging and must rely on initial evidence and acceptance by other stakeholders. This step typically comes after the local leadership has bought in and the pioneer companies are already working locally.

MolenGeek, a nonprofit based in Molenbeek, Brussels, that aims to make the technology sector accessible to all, demonstrates the idea of creating a tech ecosystem among excluded communities. Molenbeek is one of the poorest neighborhoods in the Brussels-Capital Region of Belgium. Its population is predominantly third- or second-generation North African (mainly Moroccan) immigrants, and 40 percent of its residents are unemployed.

MolenGeek’s ongoing activity unites several functions under a single umbrella: Entrepreneurs from the community are invited to use the coworking space and enjoy high-tech-level office service that they would not otherwise be able to access; long- and short-term training programs are held within the same space; and dynamic tech events, such as hackathons and technology talks, are aimed at MolenGeek’s participants but also (and significantly) at the wider community of Molenbeek.

The local coworking space, trainings, and tech events also build awareness within the community about the opportunities that tech professions have to offer. Locals notice the physical signs of the coworking space in their own neighborhood; word gets around about the local young people and business entrepreneurs from the area taking part; and local young people, business leaders, and anyone else with an interest have opportunities to learn about high tech through the meetups. Moreover, the tech events attract a wide range of visitors inside the facilities, building the high-tech community’s awareness of the local talent’s capabilities.

Component 4: Recruiting the government | Finally, the Tech Inclusion model also requires recruiting government support to make inclusion in the tech industry socially and economically sustainable. Active involvement on the part of the government, especially in funding initial integration efforts, is critical for encouraging the tech companies to take the extra steps necessary to hire inexperienced employees from the excluded community. Hiring untried engineers has costs and risks: the cost of the nonproductive learning period and the risk of losing a portion of the candidates. These price tags are even higher when alienation, or even hostility, exists between the excluded and dominant societies. Since philanthropy does not typically subsidize the extra costs and risks of private businesses, the only nonbusiness body that can take up such subsidies is the government.

Government has a vested interest in encouraging mass participation of the excluded community. The effort is a just social cause that also brings economic benefits, correcting a severe market failure: the ever-growing shortage of technology employees and the existence of a large number of underemployed citizens. The alternative of overseas outsourcing does not generate the local talent reservoir that serves the national interest.

Governments commonly subsidize training and placement services but rarely support the initial stages of employment. A working paper by the Center for International Development at Harvard University reviewing a large body of active labor policies shows that only 10 percent of the policies included wage subsidies. Yet wage subsidies, the paper shows, are the most effective government intervention for increasing access to new jobs and better wages: Beyond the support they provide for businesses, they also increase the earning outcomes of newly integrated employees by approximately 11 percent. By comparison, placement and consulting services increase earning abilities of the end population by 2 percent, while vocational trainings increase them by 6.7 percent.

Recruiting government support involves building a belief in the feasibility of the program, which is best done by studying the success of the work of the pioneer companies (component 1). Government should be informed of and participate in awareness-
monitoring. Financial and governmental institutions require large technical support roles, as well as web content development and the excluded community. These include quality assurance and education yet are still higher paid than average for members of who perform less-skilled jobs that don’t require an academic information accelerate. The industry employs large numbers of people placements for talent, and will be even less so as technology and automation of traditional industries, running a production floor has become a skilled profession that doesn’t require an academic degree. In certain contexts, therefore, the Tech Inclusion model can work very well when local tech industries do not have high educational barriers.

Third, the Tech Inclusion model works well for excluded communities that are concentrated in a geographical area. The proximity of people from the excluded community amplifies the impact of awareness-raising tools, whether for young community members, college students and graduates, and high school students or for their parents and the larger community.

In addition, the designated NGO should have core personnel from the tech industry. Often, well-meaning NGOs reach out to companies but fail to address their business and technological concerns or establish the necessary professional and social rapport. Founders and board members of the NGO who have technological and business credentials may reach out to IT firms through personal contacts and networking, leaning on established trust to engage the companies. Having technology- and business-savvy personnel on the NGO team also enables it to make the necessary adaptations in its training and placement activities.

The Tech Inclusion model is instrumental for jump-starting the inclusion of the excluded community in the high-tech industry. Once inclusion expands, not all components of the model are equally necessary. For example, barriers for candidates to join mainstream companies outside the neighborhood will lessen. Moving on smoothly to the next phases of integration requires a critical mass of tech employees from the community and at least a small number of tech companies operating within the community. These two factors will continue to grow the trust of the community in the potential of high tech and sustain the change in education patterns and focus. Tech Inclusion cannot transform societies on its own. Problems of inequality and exclusion demand systemic solutions that go beyond the model. However, in areas with thriving tech industries, the Tech Inclusion model allows for more populations to share the wealth that these industries afford. It offers a way to work against the growing gap between the paralyzing poverty of excluded communities and the phenomenal wealth that tech industries bring.

Notes
1. All participants’ names in this article have been fictionalized to protect their identities.
5. The effectiveness of wage subsidies is receiving increased recognition. A September 21, 2021, tweet from OECD Social, for example, announced that a third of OECD countries have introduced or increased hiring subsidies to help companies recruit more young people.