

Gotesman Bercovici, Elisa; Bercovici, Adrian

## Article

# Israeli labor market and the Fourth Industrial Revolution

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# ISRAELI LABOR MARKET AND THE FOURTH INDUSTRIAL REVOLUTION

Elisa Gotesman Bercovici<sup>1\*</sup> and Adrian Bercovici<sup>2</sup>

<sup>1/2)</sup> Bucharest University of Economic Studies, Bucharest, Romania

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**Abstract**

In recent years, we have witnessed the effects of the Fourth Industrial Revolution on the labour market. Technological changes, internet use, and robotics are changing the practices, services, and needs of organizations and employees in the labour market. These changes represent both a threat and an opportunity for the significant economic development of many populations. This article aims to examine the current and expected implications of these changes in the labor market in Israel. The research presented in this article was conducted by in-depth interviews with two leading infrastructure organizations in Israel. These organizations have a broad understanding of the labour market gaps and opportunities, work with hundreds of actors in the labour market eco system (employment organizations, employees, employers, educational institutes, government, philanthropy). The results of the study suggest what some eco labour actors should do to cope with changes in the labour market due to the Fourth Industrial Revolution. We emphasize the need of new skills (up-skilling, re-skilling), Life Long Learning (LLL), new professional knowledge, and adopting further actions to older and diverse populations that will take a more significant part in the future labor market in Israel. In addition, we present some examples of programs that both researched organizations attempt to address these challenges in Israel.

**Keywords:** Industry 4.0, job mobility, employment discrimination, re-skilling, up-skilling, Life Long Learning, Non-Profit Organizations, employment organizations.

**JEL Classification:** A10, D7, D8, E24, J08.

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\* Corresponding author, **Elisa Gotesman Bercovici** – [elisagotes@gmail.com](mailto:elisagotes@gmail.com)

## Introduction

In recent years we have witnessed the unfolding of the Fourth Industrial Revolution (or 4.0 Industrial revolution). Schwab (2016) states “this revolution is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres”. Others describes “a world where individuals move between digital domains and offline reality with the use of technology to enable and manage their lives.” (Xu, et al., 2018).

Arntz, et al. (2016) claim that the 4.0 Industrial revolution has been changing society as a whole and businesses in particular.

The technological advance brought by the 4.0 Industrial Revolution shifts the production and services of many industries towards digital characterization Sandru, et al., (2019). It includes artificial intelligence (AI), cloud technology, robotics, products designed by computers, three-dimensional printing (3D), automation, and industrial internet of things (IoT). Jolley (2018) states that the new Gig Economy (employees as independent contractors) will be more significant. This phenomenon will affect all types of sectors NPO's among them Gotesman Bercovici, et al. (2017).

Those changes will affect all labour market eco system (employment organizations, employees, employers, educational institutes, government, philanthropy). Most of today's skills required in different professions will soon become outdated. Jobs will disappear, and new ones will replace them. According to Mckinsey Global Institute, “by the year 2030 globally almost 375 million people have to learn and master fresh skills as their current jobs may evolve or perish along with the rise of automation and capable robots/machines.” In the opinion of Annunziata, et al. (2018), the skills required by the new labor market will have to be “a combination of STEM (Science, Technology, Engineering and Math) and creativity, critical thinking and problem-solving abilities”. The whole eco-system must support employee's re-skilling (acquiring knowledge and new skills to have access to new jobs), and up-skilling (improving current knowledge and skills to enhance the quality of the job).

*Skills can also be set by:*

- Basic skills - digital orientation, basic mathematical ability
- Soft skills - interpersonal abilities, personal communication, proactive abilities
- Professional skills - familiarity with the new profession and its varying requirements
- Life Long Learning (LLL) - learn how to learn.

LLL is a diverse, flexible and available learning ability. It is no longer a learning that takes place formally, in a definite place and in a defined time, but rather a learning that is done by the learner, through different means, at different times and places. LLL does not just refer to the professional skills required for certain positions. It trains the employee for broader skills that can assist him in a variety of roles and in various areas of life. It also boosts a sense of independence, personal responsibility and proactivity. Moreover, it encourages creativity and initiative. In light of technological improvements, another phenomenon is expected to affect human life. According to United Nation Report (2015), estimates that in the decades to come, many more people will live towards the age of 100. Therefore, the retirement age from work will change towards a later age than it is today (World Economic Forum, 2017).

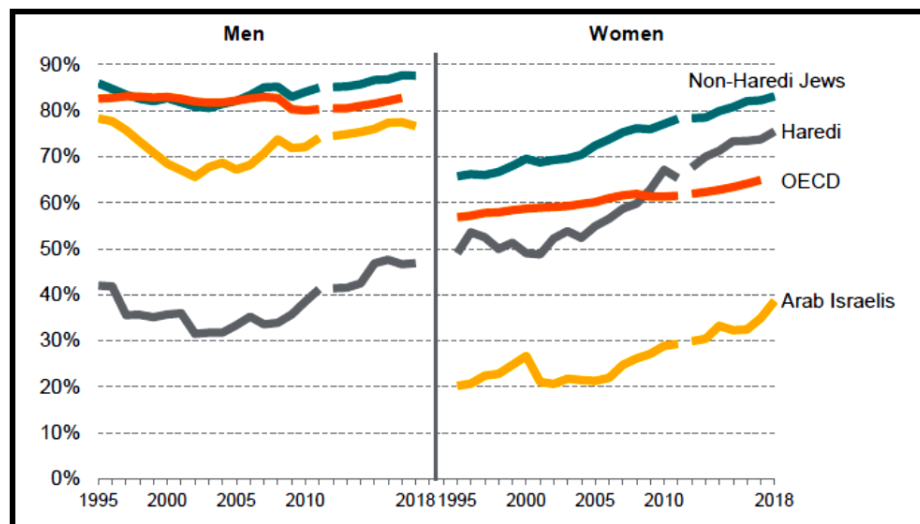
The changes mentioned above in the labor market can be an opportunity for adequate job mobility of general and discriminated employees both within existing organizations and in new ones. It is also an opportunity for self-employment. The eco-system must consider how employees will reach adequate job mobility by economic improvement, professional development, improved employment conditions, an enhanced sense of subjectivity regarding his employment status.

### 1. Industry 4.0 and the Labor Market in Israel

The Israeli labour market can be analyzed from several aspects. Some are evidence of its strength like the unemployment rate- 3.8%, (Central Bureau of Statistics, Aug 2019), and its impressive High Tech sector. Other aspects indicate large gaps between populations that do or do not participate in the labor market.

Gini index in 2017 was 0.35% (after tax payments). Also, traditional Industries suffer from low productivity (OECD, 2017).

Diverse or discriminated populations that are growing at a fast pace are not sufficiently represented in the labour market today. Examples are the Arab population, Ultra-Orthodox men (Haredi), people with disabilities, Ethiopian Jews (Taub Centre Report, 2018). Moreover, some of those who are already employed find it difficult to advance to a better position. According to the Israeli Central Bureau of Statistics in 2018, by the year 2059, the proportion of this discriminated population will increase to 50% of the total population. The figure no. 1 shows the distribution of the labour force in Israel. “Non-Haredi” Jews refer to secular people (that are not included in the discriminated population).



**Figure no. 1: Employment rates by population group and gender  
Ages 25-64 in Israel**

*Source: Taub Center for Social Policy Studies in Israel, 2018, pp. 88.*

Observing at average life expectancy index, from World Health Organization 2018, Israel is ranked as the 9<sup>th</sup> country in the world due to her the high average life expectancy - 82.3 years (for both sexes).

Along with the expected changes in the labor market in light of the 4.0 Industrial revolution, actors in this eco-system should take more action in preparing themselves for the expected changes, especially regarding the discriminated population. (Gotesman Bercovici, et al., 2019)

## 2. Research Methodology and Findings

We collected information from 2 significant infrastructure organizations that develop new programs and have been advising, in the field of employment in Israel for the past two decades. Both organization work in collaboration with all the actors in the eco-system.

The organizations are: JDCTevet (Joint Distribution Committee) and Zionut2000.

We performed in-depth interviews with program managers of these organizations and analyzed data between the years 2017 and 2019.

We asked them:

- What implications does the 4.0 Industry revolution have on the employment market in Israel?
- What programs has your organization developed to address these challenges?

We asked the respondents to address several stages in the employment world (Table no. 1).

**Table no. 1: Stages in the world of employment in Israel**

Stage	A	B	C	D
Content	Preparation before entering the labor market.	Recruitment process	Employées promotion processes	Preparation for retirement

We asked the respondents to address 3 points of view:

- *Employee point of view (not self-employed)*
- *Employer organization point of view*
- *Employment organization point of view*

In the next tables, we present the results, from each point of view concerning the current status and the future new demand in light of the 4.0 Industrial revolution.

Besides, we present examples of new programs that JDCTevet and Zionut2000 developed to deal with those new needs (Table no. 2).

Table no. 2: Employee point of view

Stage-Content	Current status	Future demand in light of the 4.0 Industrial revolution
<b>A</b> Preparation before entering the labor market	New knowledge will be supplied by other actors in the eco-system	<ul style="list-style-type: none"> <li>• Self LLL new skills, knowledge</li> <li>• Self LLL about the eco-system of his industry, employer corporate culture and the way they work through on line information</li> </ul>
<b>B</b> Recruitment process	The employee is more guided by the HR of the employer, or employment organizations through the recruitment process	Employee will be more active and controls or even influence his recruitment process, using new technological means
<b>C</b> Employee's promotion processes	<p>The employee depends mainly on the employer's willingness to promote him.</p> <ul style="list-style-type: none"> <li>• Promotion is interpreted as advancement in the professional responsibilities of the job</li> <li>• Employees over the age of 45 feel that the organization invests less in their professional development</li> </ul>	Employees take responsibility of their promotion process through LLL, develops new skills (up-skilling; re-skilling)
<b>D</b> Preparation for retirement	<ul style="list-style-type: none"> <li>• The retirement age in Israel for women is 62 and for men 67</li> <li>• Employees are not aware of all their financial rights</li> <li>• Employees fear from the retirement social aspect (loneliness)</li> </ul>	<ul style="list-style-type: none"> <li>• The retirement age will advance towards 70 - 75 (people will live longer)</li> <li>• Employees will be more active and through LLL will manage their rights and opportunities</li> <li>• Employees will use new social media networks to discharge their fear of loneliness after retirement</li> </ul>
Examples of programs that meet the new needs	<p><b>Skill up</b> (JDC Israel Tevet)</p> <p><b>Aim of the program:</b> to develop services that answer the needs of low-paid and low-skilled workers over the age of 25, by LLL mechanisms.</p> <p><b>For</b> small and medium employers up to 500 employees</p> <p><b>Model of work:</b> Professional short course for employees.</p> <p>The employer will receive a voucher for each course and each employee that he chooses.</p> <p>In order to receive the voucher, the employer must commit to raising the employee's salary at the end of training by at least 6%.</p>	
Examples of programs that meet the new needs	<p><b>WeCode</b> (JDC Israel Tevet with high education, Ministry of Labour and Social Welfare and Social Services)</p> <p><b>Aim of the program:</b> entering the high-tech world and development for young people from the social and geographic periphery.</p> <p>Admission to the program is based on unique qualifications, which know the potential, motivation, perseverance and thinking patterns that are</p>	

Stage-Content	Current status	Future demand in light of the 4.0 Industrial revolution
	appropriate for the profession. Admission to the program is not based on a previous academic degree, matriculation, psychometric or previous programming experience. <b>Model of work:</b> A combination of training and practical practice (about a year) with mentors from the industry.	
Examples of programs that meet the new needs	<b>Skills Camp</b> (JDC Israel Tevet) Enables practical and experiential experience, which includes practicing skills and improving them to remote, low-awareness populations. <b>Model of work:</b> Outdoor tasks ask the participants to take responsibility in a group setting and in a new and non-routine environment. In this situation, leaving the safe and familiar area, is meant to simulate the changing world of work. In an unfamiliar environment, the need for change and learning a variety of new skills are key features.	
Examples of programs that meet the new needs	<b>Talent Digital</b> (JDC Israel Tevet with Google, Ministry of Social Welfare and Social Services) <b>Aim of the program:</b> it was developed due to the existing shortage of manpower in the digital professions, together with the acknowledgement of the fact that this industry does not have sufficient representation for discriminated populations. Assisting the government in creating a mechanism for identifying new professions and building training in these areas. <b>Model of work:</b> Professional high-tech and digital short courses and training aimed at discriminated populations. The program includes candidate recruitment, screening, professional training along with soft skills and placement assistance.	

In the next table we present the employers' point of view. In this context, we present the conclusions about employers who are incorporated in business: companies Inc. that work with our research organizations, and not employers as government offices or NPO's organizations (Table no. 3).

**Table no. 3: Employer organization point of view**

Stage-Content	Current status	Future demand in light of the 4.0 Industrial revolution
<b>A</b> Preparation before entering the labor market	Employers relies mostly on the employee or on others actors in the eco-system to adjust to the company needs for professional training or skills (up-skilling; re-skilling) before entering the labor market	Employers will more active in developing new solutions together with all the eco-system actors, in order to welcome new candidates, especially discriminated populations
<b>B</b> Recruitment process	<ul style="list-style-type: none"> <li>The process is not satisfying tailored to different employee's needs, especially not for</li> </ul>	Employers will make more necessary adjustments for divers' population.

Stage-Content	Current status	Future demand in light of the 4.0 Industrial revolution
	discriminated populations or old age <ul style="list-style-type: none"> <li>The recruitment process is not enough transparent to the candidate</li> </ul>	The process will be both internal with HR and professional managers, and external with other eco system actors, that will make use of new technological tools in order to adjust more the recruitment process to individual needs
<b>C</b> Employees promotion processes	Employers interprets employee promotion mostly as vertical promotion, climbing up to a managerial position, or an increase in salary and not by investing in employee skills (up-skilling; re-skilling)	<ul style="list-style-type: none"> <li>Employers will have to allocate organizational resources for the development and implementation of new skills and abilities for employees</li> <li>Training courses will be offered in a number of new ways, such as: <ul style="list-style-type: none"> <li>delivered by the company (in house);</li> <li>online courses;</li> <li>collaboration among companies that might or might not work in the same field of interest;</li> </ul> </li> <li>make adjustments to the organization culture and practices for multi-age management of employees</li> <li>promote more employees aged 45+</li> </ul>
<b>D</b> Preparation for retirement	Employers are relying mainly on external organizations from the eco system to prepare employees for the retirement process	<ul style="list-style-type: none"> <li>Employers will take more significant part in preparing employees for retirement by providing relevant training on their financial rights and social aspects</li> <li>make gradual necessary organizational changes (practices, knowledge, culture) to extend employees retirement age towards 70-75 age</li> </ul>
Examples of programs that meet the new needs	<b>Employment promotion</b> (JDCIsrael Tevet with employers', government) <b>Aim of the program:</b> meant for low-wage workers from a variety of discriminated populations that are not satisfied with their employment status and who wish to advance in their current or other work. Define their field of work according to their skills and occupational predispositions. Improve their situation in one or more of the four promotional dimensions: <ul style="list-style-type: none"> <li>Economic improvement: increase in wages, expansion of office,</li> </ul>	



Stage-Content	Current status	Future demand in light of the 4.0 Industrial revolution
	<p>improvement of social conditions and related conditions.</p> <ul style="list-style-type: none"> <li>• Professional Development: Promotion of the job by expanding responsibilities, be more advanced or more professional.</li> <li>• Improved working conditions: Beyond direct employment, more flexible working hours, arrival time and the like.</li> <li>• Subjective improvement: Improving employee satisfaction with work, skills utilization, job security.</li> </ul> <p><b>Model of work:</b> Personal individual or group, long-term employment guidance provided by professionals in the employment field. The program is implemented together with employment organizations.</p>	
Examples of programs that meet the new needs	<p><b>Career routes</b> (JDC Israel Tevet with employers' organizations)  <b>Aim of the program:</b> meant for low-paid workers who stay in the same work place over time, do not realize their potential and skills, and are motivated to advance in the labor market.  For businesses in high demand, employing over 100 employees, out of which at least 25% are in entry-level jobs (most of whom earn a low salary).  <b>Model of work:</b> The program offers 6 tracks to promote low level employees</p> <p><u>3 tracks that lead to the expansion of the employee's position by up-skilling</u>  <i>Expertise</i> - Acquiring additional knowledge and tools in the field  <i>Mentoring</i> - Veteran employees mentor new employee at the job entry  <i>Project</i> - Providing project responsibility to the employee</p> <p><u>3 tracks that lead to the possibility of switching between positions by re-skilling</u>  <i>Change of position</i> - Employees acquire new professional knowledge  Academics - Employees acquire high education degree  Entrepreneurship - Employees develop additional revenue channels</p>	
Examples of programs that meet the new needs	<p><b>Flywheel</b> (Zionut2000 with Beiahad Foundation)  <b>Aim of the program:</b> to create a network of businesses working together as an answer of the growing demand for skilled workers in a changing industrial landscape, low public investment in such programs, low public perception, by improving training and education.</p> <p><b>Model of work:</b> Businesses working together (a group of 30-40 by industry) on an ongoing and proactive basis, impacting the education, training and employing new and existing employees within their sector, in response to the expected changes. Goals to reach 6 sector-based partnerships – each focused on 1-2 professions over a four-year period.</p> <ul style="list-style-type: none"> <li>• The initiative started in 2019, is in the early stages of building two employer groups, in the construction and metal industries.</li> </ul>	

Stage-Content	Current status	Future demand in light of the 4.0 Industrial revolution
Examples of programs that meet the new need	<p><b>HUB 45-75</b> (Zionut2000 with JDC Israel Tevet, government)</p> <p><b>Aim of the program:</b> creating best practices models for business, to work with older populations, aged between 45-75.</p> <p><b>Model of work:</b> Six large business organizations were selected to develop models tailored to the needs of this population at all stages of employment (A-D).</p> <p>The models are developed together with all the actors in the eco-system of the labour market. Results are expected by 2020</p>	

In the next table we present employment organizations' point of view. There are dozens of those organizations, incorporated in three major forms:

- **Opportunity centres:** employment centers established by the Ministry of Social Welfare and Social Services. Those are urban and regional centers that coordinate all of the municipal programs available in the employment field for welfare populations.

- **NPO's** that specialize in weak or discriminated employees like: Be-atzmi (unemployed people for long time, without a high education background); Kavmashve (for Arab population); Olim Beyahad (for Ethiopian academic population); Appleseeds Academy (Reducing digital gaps for all population).

- **For profit employment organizations** that start providing special programs to employers to work with discriminated population. An example of such an organization is Manpower Israel.

The majority of services which these organization offer, refer to the first stages in the world of employment in Israel A, B. Few programs relate to the stages C, D (Table no. 4).

**Table no. 4: Employment organization point of view**

Stage-Content	Current status	Future demand in light of the 4.0 Industrial revolution
<b>A</b> Preparation before entering the labor market	Employment organization focus on the technical side of the process for finding a job (how to write a resume correctly, how to look for positions). It puts little emphasis on developing skills of employees	Employment organization will provide more: <ul style="list-style-type: none"> <li>• training on improving skills (basic, soft, LLL)</li> <li>• professional training for new professions</li> </ul>
<b>B</b> Recruitment process	Employment organisation accompanies the candidate employee for a short period of time through the process of recruitment, without paying enough attention to the needs of the business organization	<ul style="list-style-type: none"> <li>• Employment organization will guide and teach candidates how to present their skills in the recruitment process</li> <li>• Employment organization will guide the processes for a longer period of time, along with paying more attention to the future needs of the employers</li> </ul>
<b>C</b>	Very few employment organizations	Employment organization will

Stage-Content	Current status	Future demand in light of the 4.0 Industrial revolution
Employees promotion processes	are involved at this stage alongside employers	provide new services to both employers and employees, together with other eco system actors like: <ul style="list-style-type: none"> <li>• training process of employees require new skills (up-skilling; LLL)</li> <li>• in the process of learning new professions (re-skilling)</li> <li>• in the process of further job mobility for new divers' employees</li> </ul>
<b>D</b> Preparation for retirement	There are currently only 6 employment organizations (all NPO's) that specialize in employees aged 45-75. Mostly supportive of unemployed workers, finding second / third careers	<ul style="list-style-type: none"> <li>• There will be dozens of employments organizations specialized in workers aged 45-75</li> <li>• Employment organization will play a major role in the process of delaying the retirement age to 75, by offering their help in training the eco system actors in multi-age management new needs</li> </ul>
Examples of programs that meet the new needs	<b>Emtza Haderch</b> (JDC Israel Tevet with Ashalim, government) <b>Aim of the program:</b> to provide employment guidance centers for the population aged 45-75, based on existing urban employment or a different infrastructure. The development of employer relationships in the program will be carried out with the aim of increasing the integration of the older population into quality employment, understanding the barriers of employers in hiring the older population, and building intervention programs that will reduce or resolve these barriers. <b>Model of work:</b> implemented in 3 cities in different ways: <i>Short-term intervention</i> - completion, updates, soft skills development and placement <i>Long / Modular Track</i> - professional training / retraining, updating and placement <i>Business Entrepreneurship Development</i> - develop self employment capabilities	

As part of the response for the trend towards more *independent workers*, JDC Israel Tevet (in collaboration with other actors in the eco system) have developed several programs. One of them is Link: Online Trade Skills Program.

**Aim of the program:** to give discriminated employees, that are out of the labor market, an opportunity to return to the developing labor market in the field of online commerce (E-commerce)

**Model of work:** offers a broad and ongoing holistic response to the needs of an online actor, throughout the first year of operation, from training to business operations.

The program operates in three ways that match the 4.0 Industrial revolution needs:

*E-skills:* developing personal skills with an emphasis on proactivity and motivation, self-management skills, communication, collaboration and teamwork, networking and personal branding.

*E-commerce:* professional knowledge.

*E-community:* developing awareness of the possibilities and benefits of business relationships and community.

Moreover, the interviews with the two infrastructure organizations, JDCTevet and Zionut2000, point to the need of all the actors in the ecosystem to collaborate in view of adjusting to such a significant change in the labor market.

## Conclusion

The last few years have been characterized by the 4.0 Industrial Revolution, where the labor market deals with significant transformations that result from changes in technologies, developments in the fields AI, cloud technology, robotics, (3D), automation and IoT. This change can bring about challenges, on the one hand, and many opportunities for the actors of the ecosystem labour market, on the other. Many professions may disappear, while others will be renewed or brand new.

Alongside with new professions and knowledge, employees will be required to have new, improved skills and professions. Adding to these challenges, in Israel, we witness two more aspects that are worth paying attention to. First, the retirement age is being delayed. Second, by the year 2059, the proportion of the discriminated employee population will increase to 50% of the total population. The research shows that all the actors in the ecosystem labour market should be responsible for coping with these changes and looking for feasible solutions. We stressed the changes to be made by three actors from the ecosystem labour market: the employee, the employer, and the employment organization. The critical changes that employees will need to adopt will be to “learn how to learn” by themselves, to acquire new skills and to be proactive given their job mobility.

Employers play an important role in employees' new training skills and professional promotion. This can be done by allocating resources, changing practices, creating an environment of training new or existing employees (as part as up-skilling or re-skilling). All of the above can make employees more efficient and effective in the long run. Besides, organizations will have to adjust themselves to working with older employees, and so will have to demonstrate multi age management. Employment organizations will provide new services to the actors in the ecosystem labor market. They will have to understand the needs of employers better, to be more involved in each stage of the employment world in Israel (A to D).

One of the limitations of this research is the relatively small number of participants. Therefore, we recommend further research into the part each actor in the eco system labour market should play.

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