Annex 1. Data specifications

Data treatment for forecasting was undertaken as follows:

1. The timeframe focused on jobs posted between 1 June 2020 and 30 March 2022.

2. The timeframe was arranged in weekly/monthly intervals.

3. Intervals have different numbers of jobs, thus different numbers of skills were extracted. We identified two sources for such variability: fluctuations due to the demand, and fluctuations due to the additional hubs scraped. To account for the scrapers variability, we standardized the number of jobs (and skills) by dividing the relevant frequency by the total frequency of jobs (or skills) extracted in that interval. This provides a metric that measures the share of jobs (or skills), irrespective of the total jobs scraped. This metric allows studying the change of shares over time and deducing trends.

4. Time series for skills were analysed using a simple autoregressive model to deduce the trends (upwards/downwards). In addition, a moving average smoother was employed for more accurate forecasts, with a window of 10 past lags and 1 future lag for the iteration specifics.

Annex 2. Impact of technology and remote working on demanded skills

Digital business platforms aim to converge both physical and digital spaces. They ensure an interoperable environment for different systems and services. Those platforms could be categorized in one of the following areas:[67]

Information system platform: to support front and back end operations, such as enterprise resource planning. Those platforms allow employees to interact with the workplace environment and offer front end users the needed applications and services.

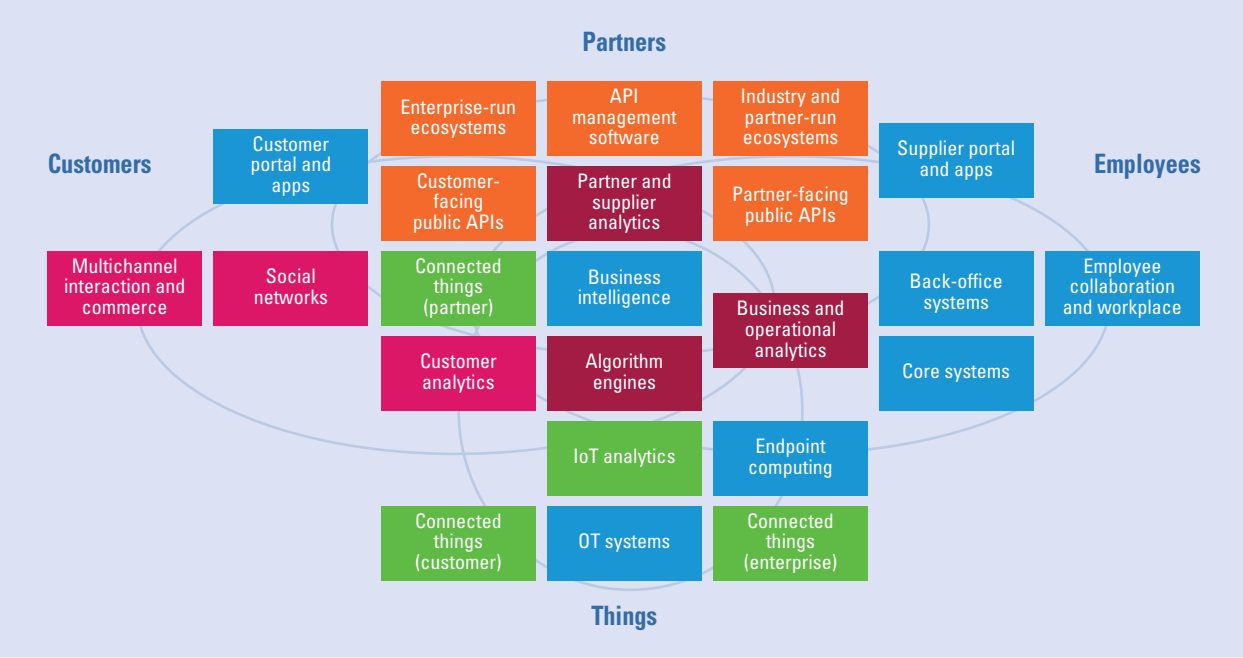
Customer experience platform: that includes customer applications. Those platforms support multi-channel interactions, access to social networks, and customer analytics.

Data and analytics platforms: those platforms are dedicated to data-driven decision support systems.

Internet of things (IoT) platforms: to provide integration of core and operation systems. Those systems offer connectivity to enterprise-owned things and to customer-owned objects They also support the provision of analytics on usage for monitoring and decision support purposes.

Ecosystem platforms: those platforms ensure connection to external actors thru application programming interfaces (APIs).

Figure A2.1 Interaction among digital business platforms



Source: Panetta, 2016.

The development of those platforms is empowered by huge progress in programming tools and environments. Globally, 113 countries in 2020 were deploying real-time digital systems.[68] Examples of such tools are RapidPro – a global digital public good used to power messaging programmes, Kobo, Open Data Kit (ODK), Ona, Commcare and District Health Information Software 2 (DHIS2). Due to COVID-19 imposed conditions, countries are widely deploying digital platforms in several sectors:

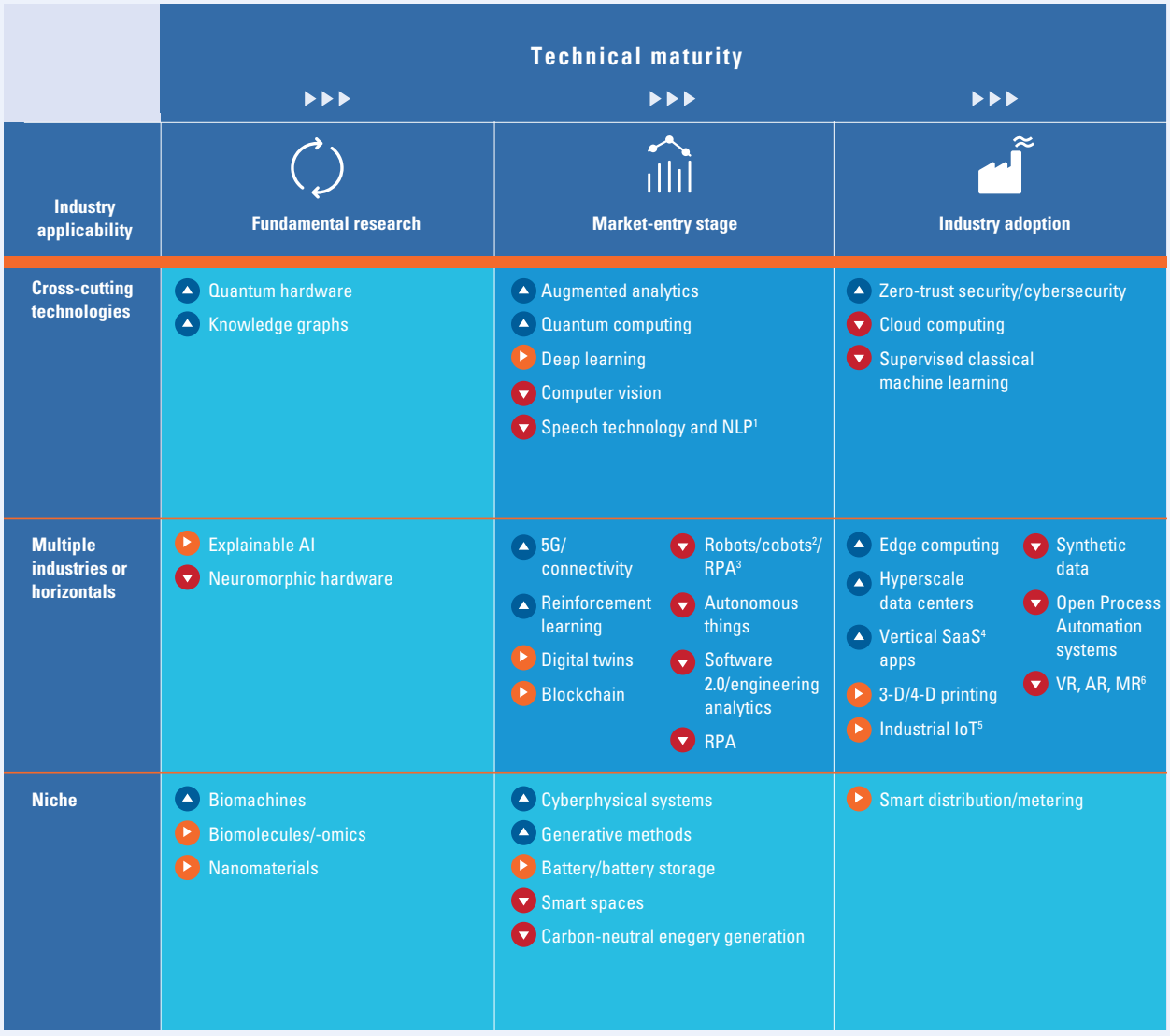
E-learning: in order to offer distance learning to millions of out-of- school children and help children return to school. UNICEF Learning Passport platform is one example that has been developed in partnership with Microsoft.

Public admin/e-Governance: many platforms were developed to provide services such as civil registration and vital statistics systems. Primero X, launched by UNICEF in partnership with Microsoft is an example of web application that can meet the demands of the social welfare sector.

E-commerce: due to COVID-19 imposed movement restrictions in almost all countries, digital trade transactions noticed a significant increase on national and cross-border levels. The development of digital intermediation platforms played an important role in fostering those transactions.

E-health platforms to adhere to infection prevention and control measures were developed, such as immunization dashboards, using existing datasets and real-time monitoring to enable beneficiary registration, feedback and coverage analyses. It goes without saying that 4IR technologies supported the development of those platforms and offered to them additional features that were previously unimaginable. Figure A2.2 shows the distribution of those technologies among the three categories (fundamental research – market entry stage – industry adoption).

Figure A2.2 The distribution of those technologies among the 3 categories (fundamental research – market entry stage – industry adoption)



Source: McKinsey and Company, 2020.

The following technology elements could be used for the development of platforms:

Cloud:
it ensures a cost-effective framework to develop platforms.

Data and analytics:
it allows to integrate data from different data sources.

DevOps:
it allows the development, scaling and maintaining platforms to ensure incremental innovation and continual improvement of its features.

Agile:
it allows to incorporate customer feedback into the project lifecycle.

Partnership:
enhancing partnership could expedite the development of platforms.

Cyber security:
combating cyber fraud in digital platforms and securing content requires efforts from all parties to ensure all technical and procedural measures are implemented.