Is the digitization of the labor market
in the general interest?

Laurent Cytermann,
Conseil d'État

Abstract:
The digital revolution is unfurling in the labor market. While one out of two job offerings is posted on the Internet, older channels of recruitment are still important. Major changes are under way, as new players and practices emerge: the social media, search engines and new recruitment methods directly based on skills and know-how-to-be. Nonetheless, the question remains open about whether the digital revolution will improve the operation of the labor market. It has not yet been able to respond to the growing difficulty of recruiting personnel despite the high jobless rate. A few lines of thought are presented for an "augmented public employment service" capable of seeing to it that a digitized labor market will be more conducive to the general interest.

In December 2015, the magazine *Society* put on its cover Paul Duan, the founder of the nonprofit startup Bayes Impact, and attributed this statement to him: "*With a simple algorithm, we can reduce unemployment by 10%.*"[1] The algorithm, Bob Emploi, coaches job-seekers by using matches to propose the most relevant direction for conducting a job search. It drew the attention of the media and political circles. Three years later, Bob Emploi is still operating, but comments by the media are less lenient: "*Bob Emploi, this magic app that supposedly halts joblessness has not performed any miracles*" and "*Bob Emploi or the delusions of big data*".[2] This is not, in fact, the first time that the promise had been made to reduce unemployment thanks to digital technology. In 2011, the startup Qapa launched a website for jobs and temporary work assignments. Its stated objective was the same: reduce unemployment by 10% within two years. Like several trends in the digital realm (such as artificial intelligence or blockchains), this technology's potential for addressing labor market issues seems doomed by this alternation between excessive promises and disappointments.

The position I have adopted is to make a break with this cyclothymiac tendency in order to detect the trends actually under way. The starting point of this article is the patent observation that the digital revolution of the labor market has already occurred. The ways of recruiting personnel or of looking for work no longer have anything in common with what prevailed twenty years ago. New trends are affecting both intermediaries in the labor market and the factors that underlie new hires.

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[1] The opinions expressed herein are the author's and do not represent the positions adopted by the Conseil d'État. This article, including any quotations from French sources, has been translated from French by Noal Mellott (Omaha Beach, France). The translation into English has, with the editor's approval, completed a few bibliographical references. All websites have been consulted in July 2019.

[2] Respectively: "Bob Emploi, cette appli magique qui était censée enrayer le chômage mais n'a pas fait de miracles", *Le Figaro Économie*, 13 June 2018; and "Bob Emploi ou les désillusions du Big Data", *L'Express L'Entreprise*, 28 February 2018.

There is a much more sensitive question however: are these changes positive for the general interest? Digital technology has set off a proliferation of job offers and job applications, but the question is still standing about its "allocative efficiency", *i.e.*, whether the market can, without undue delay, produce a maximum of satisfactory matches between employers and applicants. No economic study in France or elsewhere has yet proven that the digital technology for better matching job offers and demands has actually reduced structural unemployment. In conclusion, a few suggestions will be formulated for an "enhanced public employment service" that would help see to it that the changes under way serve as best possible the general interest.

The digital revolution has already taken place in the labor market.

According to the employment website HelloWork (formerly RegionsJob), which, since 2010, conducts an annual survey on recruitment methods, the prevalence of employment websites or "job boards" is overwhelming. In 2018, they were the means most used both by 96% of the economically active and by 91% of recruiters, far ahead of traditional channels, such as unemployment offices, spontaneous job applications or personal networking.[3] However DARES' last survey on job offers and recruitments presents a subtler description of the current situation:.one out of two recruitments in 2016 involved the Internet.[4] The difference is probably to be set down to a biased selection of participants in the HelloWork surveys, who have a higher than average propensity for using digital tools. The DARES study also shows that electronic means (the posting of job offers on websites and the consultation of databases of online résumés, *CVthèques*) are often used along with traditional channels, which can be just as decisive. For instance, employers estimate that, ultimately, only 21% of recruitments were made thanks to the Internet (a rate that rose to 40% when the Internet was used during the job search). Likewise, according to Pôle Emploi (2017), job-seekers consider that online tools are indispensable for obtaining information and preparing the job search; but the majority of them find a job via a traditional channel.

Whatever the case may be, the Internet has come to be massively used within a short period of time; and the first reflex of both recruiters and job-seekers is often to turn toward the Net. This upsurge of the Internet has given birth to new players, now inescapable as intermediaries on the webscape: on the one hand, private job boards (such as LeBonCoin, HelloWork, Monster, Qapa or Keljob), which collect job offers from recruiters and post them on line; and, on the other hand, aggregators (such as Indeed or Jobijoba),[5] which, instead of directly collecting offers, reference on their website the offers collected by job boards. Though devoted to white-collar jobs, APEC's website (Association pour l'Emploi des Cadres) also ranks, with 1.3 million unique visitors, among the top ten websites.

Public unemployment offices have not been left out of this trend. According to Mediamétrie/Net Ratings (MNR) in 2018, Pôle Emploi, the French Unemployment Office, is still by far France's leading employment website: 9.8 million unique visitors per month as compared with Indeed's 6.3 million. Pôle Emploi switched strategies in 2013. Whereas one of its objectives used to be to maximize its "market share" of collected job offers, it has now staked out a position as an aggregator. Under a program (Transparency of the Labor Market) with 163 private partners, its website (www.pole-emploi.fr) references all job offers from these partners. Half of the offers on its website now come from its partners.

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[3] https://www.regionsjob.com/actualites/enquete-recrutement-emploi-2018.html

[4] The survey "Offre d emploi and recruitment" (OFER) is conducted by the Direction d'Animation de la Recherche, des Études et des Statistiques (DARES), the division of statistics at the Ministry of Labor. The statistics come from DARES (2018).

[5] The site has maintained its brand name even though it was acquired by RegionsJob in 2018. The new group bears the name HelloWork.

New players in the labor market, recruitments based on "soft skills" — coming revolutions?

The parties active in the labor market are becoming ever more diverse, to such a point that job boards are sometimes now called "traditional actors" although none of them is more than twenty years old.[6] Four new categories of online players can be pointed out:

● **PROFESSIONAL NETWORKS**, which have tapered off into a single player, LinkedIn. Microsoft bought LinkedIn for $26 billion in 2016, the same year that its rival, Viadeo, was placed in receivership (before being acquired by Figaro CCM Benchmark, which operates other employment websites, in particular Cadremploi and Keljob). According to MNR data, 16 million people have accounts on LinkedIn France, a website with 13.5 million unique visitors per month. According to the HelloWork survey, recruiters tend to use, first of all, the websites that post job offers and, secondly, online professional networks. Furthermore, the use of these networks is growing rapidly among the economically active: from 34% in 2017 to 53% in 2018.

● **SOCIAL MEDIA**. The phrase "generalist social media" mainly refers to Facebook. Used by firms for several years now to post job offers, Facebook France launched its feature for listing job offers in 2018. Thanks to it, users can instantly find job offers in their local area. According to Qapa's survey of its users, 41% thought Facebook was the most efficient way to find work, as compared with 33% for Linkedin.

● **SEARCH ENGINES**. Searching on Google is, in fact, very often the first step when looking for a job. The cybernaut can enter as search criteria the type of job and location. Google launched in 2017 in the United States and in 2018 in the United Kingdom the service Google for Jobs, presented as a *lingua franca* of the labor market. By systematically analyzing data on job offers, Google[7] has drawn up a set of job classifications, which it keeps up to date (FONDEUR 2017). Recruiters who post job offers and employment websites can enter the data on their offers in this set by using tags to make them better listed among the results of searches performed with Google.

● **WEBSITES FOR POSTING REVIEWS OF COMPANIES**. ChooseMyCompany, Glassdoor and Viadeo have staked out positions in this niche since 2017. These sites receive an increasing number of job offers, even though this was not their initial purpose. The leader, Glassdoor, now presents itself as a website for job-seekers.

This diversification of the parties present in the labor market has intensified competition, even more so since the newcomers on this market (including three of the five GAFAM firms) have larger financial resources and bigger user bases than the original, specialized players. Although no public data exists, several websites specialized in recruitment have reported a drop, within a period of a few years, in the price of job offers.[8] The value chain has shifted from the brut circulation of job offers and résumés toward services that improve the effectiveness of recruitments, mainly by using algorithms to match job applicants and offers.

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[6] See, for example, the blog "Les Jobboards vont-ils mourir?" of 2 June 2017 at
https://www.digitalrecruiters.com/blog/les-jobboards-vont-ils-mourir.html.
[7] https://jobs.google.com/about/intl/fr_ALL/.
[8] See note 6 and, too: L. Brouat's blog "Quel avenir pour les sites d'emploi quand l'offre d'emploi vaut de moins en moins" at
https://lecoledurecrutement.fr/avenir-sites-emploi-loffre-demploi-vaut-de/.

Even more important might be the changes in the criteria and practices that recruiters adopt to make selections. Till present, the digitization of the labor market has but marginally modified the information used to select among applicants. Diplomas and job-related experiences are still the major items of information figuring not only on résumés but also in job offers. However both recruiters and applicants are familiar with the limitations of these criteria, which exclude persons who could satisfactorily fill the jobs posted.

Without providing all the answers, digitization might open new perspectives. Whether based on Pôle Emploi's job directory (ROME: Répertoire Opérationnel des Métiers et des Emplois) or other lists of job classifications, digital applications can now "translate" a job or a job-seeker's occupational experience into skills and qualifications, and deduce possible matches that neither the employer nor job-seeker would have spontaneously imagined.[9]

Digital tools might also have a part to play in identifying applicants' "soft skills" (such as creativeness, critical spirit or ability to work with others), skills that 86% of recruiters deem "very important". In fact, 85% feel that such skills could be used to justify making concessions about the diplomas required; and 79%, about the work experience required.[10] Soft skills might become more important than technical qualifications due to automation and artificial intelligence, which make technical skills more obsolete (LAMRI 2018). The soft skills expected by recruiters or possessed by job-seekers could be made more visible in job offers and profiles. Online tests for assessing them are developing fast.

Assessments of the effectiveness of a digitized labor market: Inconclusive

As in many other fields of the digital economy, players in the labor market are faced with the problem of proliferating uses. By nearly eliminating the costs of posting job offers, the Internet enables applicants to consult a large number of offers and employers to receive a large number of applications. But it does not, by itself, solve the problem of relevant matches between the two. Moreover, it has inevitably led to the emergence of intermediaries capable of helping the two sides of the market meet each other, in particular via algorithms for matching job offers and applications.

At the microeconomic level, several indicators suggest that recruiters have learned to better tap the Internet's potential and that intermediaries are providing more efficient services. Whereas surveys in the first decade of the century reported a majority feeling that applications received via the Internet were not very relevant, 65% of respondents in 2016 declared that they matched "fully" or "rather well" their expectations, according to the DARES survey.[4] This improved satisfaction might shrink the "hidden market" of job offers that firms choose not to post on the Internet but, instead, to let open for informal channels of recruitment, such as cooptation. According to APEC (Sourcing Cadres), 88% of white-collar recruitments were made by posting a job offer on line in 2018 as compared with 82% in 2013.

At the macroeconomic level, it is hard to point to measurable effects of digitization. According to a report by COE (2015), a wider circulation of information should improve matches between supply and demand in the labor market; but this report could barely come up with any empirical study to back this theoretical prediction. According to an American study that used comparable data from the previous decade, the Internet has decreased the duration of unemployment for job-seekers by 25% (KUHN & MANSOUR 2014).

During the 2010s, the Internet's growth obviously did not suffice to prevent the diminishing efficiency of matches on the French labor market, nor in most eurozone countries, a deterioration

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[9] This is the case of Bob Emploi or Galaxie des Métiers, a service present on https://www.moncompteactive.gouv.fr/cpa-public/.
[10] According to the HelloJob survey in 2018. In the same sense, see Pôle Emploi (2018).

measured by the shift rightwards of the Beveridge curve (DRUMETZ & LECAT 2018), which relates unemployment and job vacancy rates. This means that, at an identical number of vacant jobs, the unemployment rate is higher than during the first decade of the century. We ever more frequently hear complaints about the difficulty of recruiting even though the French unemployment rate still hovers around 9%.[11] Of course, the Internet is not to be blamed for these difficulties, which can be set down to the massive destruction of unskilled jobs during and after the 2008 meltdown. The jobs created since then do not much correspond to those people had before the crisis. Digitizing the labor market has not significantly reversed this trend.

A hypothesis can be formulated to explain the weak macroeconomic impact of digitization. In France, the use of the Internet for recruitments is still, according to the DARES study, strongly correlated with the size of the firm (a 41% use rate for establishments with fewer than 10 wage-earners as compared with 64% for those with more than 200) and with job qualifications (33% for unskilled employment compared with 63% for white-collar jobs). The proportion of cybernauts among the economically active is still limited to 52% for persons without a diploma, a percentage that has been rising very slowly over the years (CREDOC 2017). While probably improving matches between the firms making recruitments and the applicants who are relatively better equipped with digital technology, digitization has had little impact on major segments of the labor market. In general, it encounters limitations when more is involved than making a recruiter and an applicant meet, when changes have to be made in the labor market on both the supply and demand sides, in particular for helping applicants formulate their plans for a job search and for working with employers on their recruitment methods. Accompanying human beings then proves to be indispensable.

Suggestions for an "enhanced public employment service"

Given these trends, public unemployment offices must be capable of evolving lest they become irrelevant as intermediaries on the labor market. They even have to do more than that: they have to fully play their role of "inclusion" in order to palliate the effects of inequality stemming from digital technology's spontaneous growth. They can also have an effect on the circulation of data.

Pôle Emploi has undertaken several initiatives in recent years to place digital tools at the disposition of job-seekers: the creation of Emploi Store in the summer of 2015 with applications to be used for job searches; support of Bob Emploi; and the use of young people from the civic service to introduce job-seekers to digital technology. In September 2018, the government adopted a national plan for an "inclusive digitization" (SECRÉTARIAT D'ÉTAT AU NUMÉRIQUE 2018). Given digital technology's place in job searches, a lag in digital skills could be a factor increasing the risk of long-term unemployment. Digital skills should be systematically updated. It is worth mentioning that, since a decree of 10 September 2018, the personal training account (CPF) can be used to fund enrollment in programs for learning basic digital skills.[12]

Advances could be made in developing a data infrastructure conducive to digital services. Pôle Emploi's job directory (ROME) has already been declared "reference data" in application of the Digital Republic Act of 7 October 2016. The state and Pôle Emploi thus have the responsibility of updating it and see to its reliability and security.[13] Other changes in this directory should be imagined to keep it from becoming irrelevant: Google's list of job classifications has 250,000 items as compared with ROME's 11.000. To reuse ROME, a clause could be added about "equal sharing", which would require that the modifications of the job classifications made by using the new methods

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[11] *Cf.* "Des tensions sur le marché du travail aux besoins en compétences", a conference organized by DARES in December 2018.

[12] Decree n°2018-779 of 10 September 2018 on "*la socle de connaissances et de compétences professionnelles*". Texts of French laws and decrees, as well as many court decisions, are available at https://www.legifrance.gouv.fr/Droit-francais.

[13] Articles L.321-4 to R.321-7 of the Code of Relations between the Public and the Administration.

of data analytics should be accessible to everyone, thus creating a sort of "digital commons". The job directory could also be enhanced by incorporating soft skills in job descriptions.[14] This would entail certifying software for assessing soft skills. With reference to Article L.1221-6 of the Labor Code, which limits the information demanded of job applicants to what has "*a direct and necessary relation to the proposed job or to the evaluation of professional aptitudes*", the government could require the certification of the software to be used or could at least set standards.

Thought should be given to the degree to which allowance should be made so that job-seekers' personal data may be used to improve matches between job offers and applications. When a cybernaut visits an Internet site, the advertisements displayed there are selected by using a considerable quantity of personal data collected by a complex ecosystem of players.[15] Should the personalization of the job offers presented to job-seekers on an employment website be any less sophisticated? After all, this personalization would benefit them. Likewise, the possibilities given to recruiters and employment websites to "push" job offers toward applicants with selected profiles (themselves defined by granular criteria for making better matches) are still limited. We could imagine, with the consent of the concerned, improving the sharing of data from résumés (*CVthèques*) between Pôle Emploi and the other employment websites. This would allow for diffusing relevant job offers during a period when it is hard to recruit personnel.

The success of "Transparency of the Labor Market" should not keep us from realizing that this partnership might become less relevant owing to the diversification of players in the labor market. The absence of LinkedIn in this partnership is a problem, and too of Facebook (were its jobs service to grow). Without the partnership necessarily taking the same form as ordinary employment websites, the transparency of the labor market could be improved by legally qualifying, under the Digital Republic Act, the information on job offers as "data of general interest". The communication of private data would then be allowed (DUCHESNE *et al*. 2015).

Conclusion

While the digitization of the labor market is manifest, its contribution to this market's operation is not. Several signals point to effects of inequality and to the sway that the big global tech firms might start exercising in the coming years. Given that the general interest requires a good operation of the labor market, targeted interventions by public authorities, as briefly described herein, are legitimate.

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[14] It is not well known but ROME already integrates information about soft skills by using Holland Codes, the so-called RIASEC model, which identifies six types of personalities in careers: realistic, investigative, artistic, social, enterprising and conventional.

[15] For a detailed description of this ecosystem, see the opinion issued by the Autorité de la Concurrence, *Avis n°18-A-03 du 6 mars 2018 portant sur l'exploitation des données dans le secteur de la publicité sur internet*, pp. 22-23.

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