Public Employment Services and Big Data

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by Sang Hyon Lee

It is important to develop evidence-based policies using data. Data is widely applied and collected by governments to verify and analyze the effect and performance of policies. A conventional way of using data is by first collecting it through a survey. The survey methods, however, are becoming costly and complicated. They can cause measurement errors and non-sampling errors due to lying or inaccurate answering. The use of IT and data has been developed for government services and policy decision-making to offer an alternative method to surveys. Large volumes of government data may become a foundation for new solutions or for giving us insights on government activities and polices that were previously not feasible.

Labor market actors and Public Employment Services always have wanted to find solutions for the mismatch on the labor markets. Policymakers also strive to provide job matching information for citizens. Today, clients demand a high level of e-service from the PES. E-employment service is efficient, effective, and makes labor markets more transparent. Data-based and data-driven e-employment services will improve PES in the future. Big data may provide us with a new tool to solve many issues, such as how to correctly job match, how to give a proper overview of regional labor market demand and supply, and how to see the actual effect of education on the labor market.

Big data is a term for massive digital datasets collected from various sources, extremely large, complex, raw, or unstructured. Big data cannot be analyzed through conventional relational database techniques such as Data Base Management System (DBMS). It is a new way of data management in addition to data warehousing and mining in the 2000s. Big data was first introduced in the 2010s and is being widely used in several sectors, including transportation, health, online shopping, banks, and insurance.

Big data is used for two approaches in PES. One is to find new angles for labor market analysis and the other is to apply it to the job matching websites. For the first purpose, the Master Data Base technique is used for linking databases of multiple institutions. Several PES are creating systems for big data collection and linked and merged data bases.

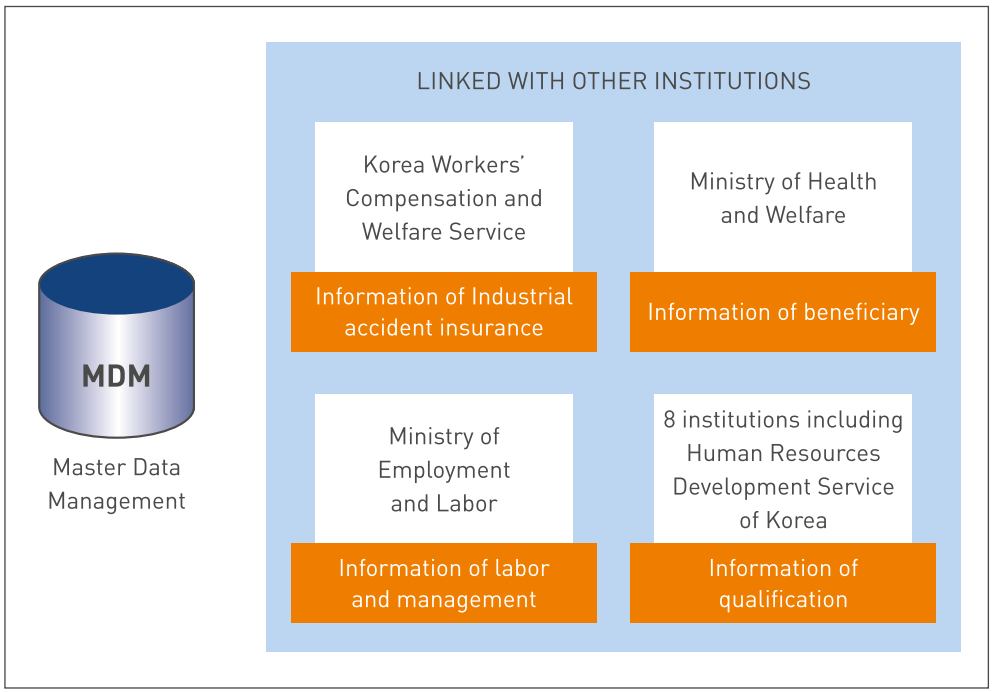

Figure 4: MDM system of Korea

The Korea Employment Information Service (KEIS) utilizes multiple databases together operating with MDM techniques. The data includes data on unemployment insurance, job matching, and training from the Ministry of Employment and Labor,

welfare recipients from the Ministry of Health and Welfare, compensation for industrial accidents insurance from Korea Workers' Compensation and Welfare Service, labor, and overdue wage. The data also checks skills and qualification data from the Human Resources Development Service of Korea, and the Korea Chamber of Commerce.

The Institut für Arbeitsmarkt und Berufsforschung (IAB) under the German PES developed Integrated Employment Biographies (IEB), which keep histories of unemployment benefit recipients, participants-in-measures, and jobseekers. The Research Data Center provides the following: 1) Sample of Integrated Labor Market Biographies, 2) Establishment Personal History of Employment, 3) Linked Employer-Employee Data, 4) Combined Working and Learning Data.

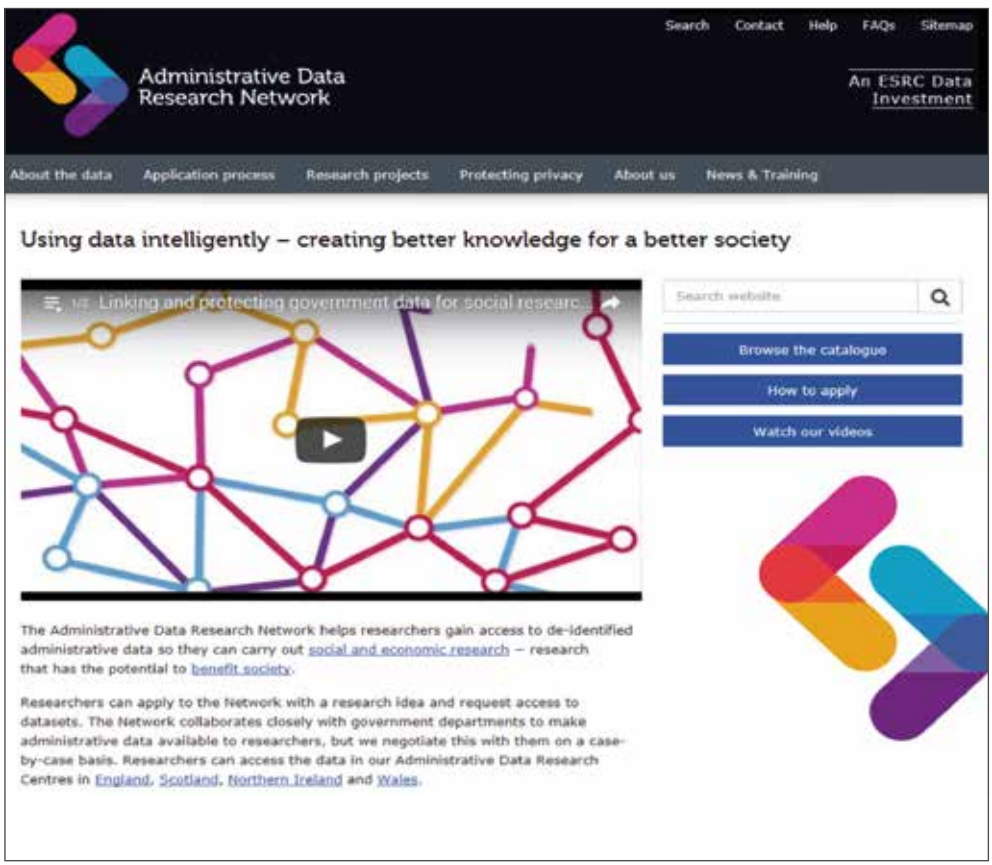

Figure 5: Administrative Data Research Network *(Source: https://adrn.ac.uk/)*

The UK manages administrative data at the Administrative Data Research Network[3]. The ADRN has established partnerships between UK universities, the government, national statistical authorities, funders, and research centers. The ADRN provides data for 1) business and third sector, 2) crime and justice, 3) economy and employment, 4) education and learning, 5) health and wellbeing, 6) population, 7) housing and environment.

One project brought together 40 million pieces of information on 3.6 million offenders. It was big data jointly collected from the Ministry of Justice, the Department for Work and Pensions, and HM Revenue and Customs. The research result would provide the government a better understanding of the links between employment, benefits, and committing an offense. Eventually, ex-offenders could be helped to go back to work and live better lives and be prevented from becoming offenders again.

The Upjohn Research Institute in the USA recently researched millions of job advertisement data using big data and text mining methods to read recent trends in job openings. They received the big data from Burning Glass, a company that uses job market analytics to make data-driven decisions. The Upjohn Research Institute found out that the level of skills and education required went up during the economic crisis. IZA, a labor market policy research institute in Germany, conducted a similar analysis using data on job openings online.

Developing new services such as automatic job matching using artificial intelligence, deep learning, and big data is another area that many PES try to develop for better job matching services. For example, Korea developed the Job Navigator using big data analysis on millions of clients who successfully found jobs. Through the Job Navigator system, clients can receive tailored services that are recommended based on a big data analysis using integrated information, including types of jobseekers and characteristics of users, service using patterns, and education, training and job search histories. Clients receive a variety of individualized employment-related information automatically, including vocational training information, information on jobs, and

3 ADRN; https://adrn.ac.uk/

government employment programs. This is based on the results of an analysis of the circumstances and stage in life of each individual user registered on the job portal WorkNet.

This is a smart matching service using big data. In the future, we may understand better how job placement mechanisms work. If we look deep into the big data, we may find company-specific skill sets and predict chances for employment using text-mining methods. Big data is already here. We need to be strategic with a long-term plan to build big data analysis systems and find methods to collect big data. Let us not just focus on gathering the data. Rather, we need to develop meaningful solutions for smart data management.

Dr. Sang Hyon Lee is a research fellow as well as the director for external affairs at the Korea Employment Information Service (KEIS). Dr. Lee took his Ph.D. in Human Resource Management at the University of Korea Technical Education. His research into employment services at the Ministry of Labor and KEIS spans 18 years. He pioneered the labor market information system of Korea, WorkNet, and founded the Employment Service Evaluation Center in KEIS in 2006. Dr. Lee is offering capacity building consultation for several countries, including Vietnam, Malaysia, Peru, and Brazil.

The new world of work is characterized by globalized employment, a mobile yet vulnerable workforce, and the challenges of demography and rising income inequality. Technological changes in both the demand for and supply of skills have a cross-cutting influence on how labor markets develop. In this book, different stakeholders from international organizations in the private and public sector discuss which role Public Employment Services and Workforce Development Agencies ought to play in the labor market today and in the future, why cooperation is crucial, and what kind of support digital services and software can provide for a more effective and efficient delivery.

Managing Workforce Potential – A 20/20 Vision on the Future of Employment Services seeks to inspire decision-makers in and around the labor market to reflect on governance, services, and partnerships to better cater to the new world of work.

Why this book?

As a world leader in Public Employment software solutions, WCC believes in sharing knowledge. It is our vision that combining what we know and sharing this with the world leads to maximum value across the board. This is why we take initiatives to both exchange and expand expertise. For example, we started the PEPTalk webinar series, which provides a platform for Public Employment Services to share their knowledge about best practices and their vision on the labor market. This book is another example; with its publication, we aim to contribute to an all-round clearer vision on the developments in public employment.

*The term **20/20 vision** is used to express normal sharpness of vision. It means you can see clearly at 20 feet what should normally be seen at that distance.*

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