

# Uncovering Concealed National Properties: Innovation of BAI's Data-Driven Audit

## I. Big data reveals 310,000 unattended land parcels (8.5% of national properties)

With the amount from prior period adjustments<sup>1</sup> found during the settlement of government accounts over the past 5 years reaching an estimated KRW 53 trillion, the BAI commenced an audit to prepare measures to secure the credibility of the national accounting system by identifying causes of such mismatch and errors in the accounting.

As a result of analyzing the cause of prior period adjustments, the audit team found that prior period adjustments mainly occur when the official in charge of state-owned properties realizes omitted or missing government-owned properties in the system and manually updates the information in the Digital Budget and Accounting System, also known as the dBrain system (operated by the Ministry of Economy and Finance (MOEF)). This implied possible defects in the management of national properties, requiring an overall check on whether the national properties are being properly managed without omissions.

In light of these facts, the BAI decided to verify the accuracy of national property data in the dBrain system by cross-checking and analyzing 5.5 million cases in the dBrain system's national property register with the 5.9 million cases in the real estate register of the Korea Real Estate Administration Intelligence System (KRAS) provided by the Ministry of Land, Infrastructure and Transport (MLIT).

In 2017, the BAI established the Audit Data Analysis System (BARON) to effectively respond to the newly digitized audit environment, and the system was linked to the data of both the KRAS and dBrain, making it easier to cross-match and analyze relevant data.

Picture 1. Big data analysis using the BARON



As a result, the audit successfully found 310,000 land parcels (8.5% of total national properties)

<sup>1</sup> Profit and loss that occur when omitted or missing government properties in the prior fiscal year are found and updated in the current fiscal year

that did not match. Based on the audit finding, the BAI notified the MOEF and related organizations to manage the national property list in a more accurate manner by periodically receiving information on the land register of KRAS. The use of BARON enabled auditors to promptly and accurately identify causes and problems in the errors of the government's financial statements and contribute to enhancing the credibility of the national accounting system through effective improvement measures.

## **II. Changes in audit environment due to digitization**

The level of digital governments is rising throughout the world. According to the E-Government Development Index (EGDI) published biennially by the United Nations (UN), the number of countries above a high EGDI level increased to 58% (111 countries) out of 193 UN signatories in 2018 from 49% (94 countries) in 2016.

Not only OECD members, but countries all over the world have introduced a digital government (or e-Government) and the majority of administrative works are now being performed using the ICT system. Therefore, the digital information subject to audit has also grown in quantity and become increasingly complicated.

Accordingly, the current paper-based audit approach has made it difficult to ensure efficient, systematic analysis on massive data. This has enhanced the burden on auditees in submitting documents required for audits, creating an environment where efficient audits are difficult to achieve.

Moreover, due to the recent spread of COVID-19 across the world, remote audits using the ICT system have now become more important than ever before.

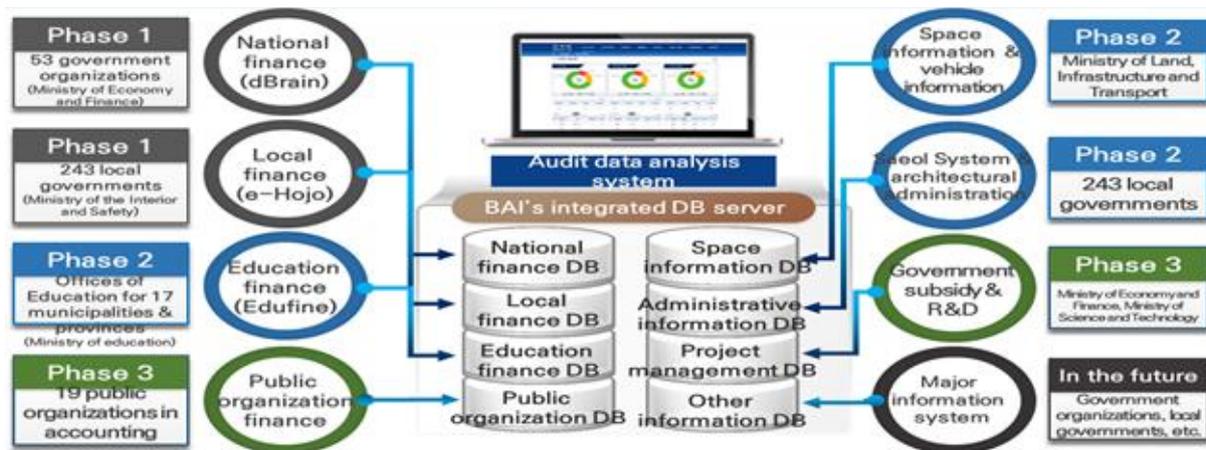
The Board of Audit and Inspection (BAI) of Korea has taken this challenge brought on by the changing audit environment and turned it into an opportunity to evolve by innovating its data driven audit. We would now like to share our experience of innovation in audit with OECD members by introducing the information system built and operated by the BAI.

## **III. Insight into the audit data analysis system (BARON)**

The BAI has worked on devising new audit methodologies using digital data and information technology to better respond to the changing digitized audit environment. In October 2015, the BAI initiated establishing the audit data analysis system called BARON, and through three phases, completed the system's development in December 2017.

The BARON is designed to regularly receive and analyze digitized data that can be used in audit (financial data, data on government subsidies, geospatial data, etc.) from auditees, such as government organizations, local governments, and educational organizations through the information and communications network.

Picture 2. BARON Configuration



The BARON consists of the following four main functions to provide key data.

First, the system restructures the data of auditees (linked to the BARON) for audit purposes and provides 'Analyzed Contents' that are the results of analysis from analysis indicators, such as the risk of financial operation, data on the current status of auditees and problems found in audit scenarios (cross-checking data or data lists to extract patterns showing irregularities and/or inconsistencies). Such analyzed contents are then used for selecting entities subject to audit and in initiating audits.

Second, the BARON provides the status on the auditee's information system, as well as key audit information and digital data (such as the document register, data on account books, government subsidies, etc.) which allow auditors to easily identify the status and problems of an audited entity.

Third, the system supports auditors to conduct easier database analyses (extract, compare, and cross-check data under specific conditions) on the data accumulated in the BARON or on the auditor's own collected data.

Lastly, by searching and analyzing land and spatial data, the BARON provides auditors with information on buildings and land (status of construction, licensing, use, etc.), related regulations and building information (owner, type of use, etc.), and visualizes the information on the map for better analysis.

The development and operation of the BARON has brought significant changes to the BAI's audit works. Before the system's development, auditors needed to create the tables and forms to give to the auditees to collect audit data. Such works also required considerable time and effort for the auditees to fill in for submission. However, the BARON enables auditors to effectively collect and analyze vast amounts of audit information and data, and with easier access to such information, auditors can better draw out and analyze weak points and suspicious activities to use in their audits. The system also lessened the burden of auditees in submitting materials for audit, making the audit system significantly more effective.

## **IV. Closing**

With the recent worldwide spread of COVID-19, Supreme Audit Institutions (SAIs) along with OECD members have facilitated discussion on how to effectively conduct remote audits. The BAI hopes that our institution's experience in innovating our data-driven audit will help other SAIs in their future endeavors.