

“U-Check”: The Korea SAI’s Customized Application for Audit Data Analysis and Management

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Background

The use of computerized data in audit work has been increasing but only few auditors use the data comparison method. Specifically, the analysis of the data is requested to the institute, increasing the load of auditing and causing risks of exposure of audit direction. The EUROSAI members mostly use commercial software (Germany, Norway, Czech Republic, Poland), or use self-developed software (Switzerland, Poland). Since commercial programs tend to have high usage and maintenance fees while the functions of the program is limited, only the core functions, such as data reliability testing or data reconciling, are implemented into the self-developed program.

Under such circumstances, the Audit and Inspection Research Institute, affiliated with The Board of Audit and Inspection of Korea has come to realize the necessity of self-developing an analysis program for inspection material. Hence, in 2012 and 2013, it developed “U-Check” in the Korean Windows OS through Step 1~2 development and also conducted self-training within the Audit Research Institute. Thereafter, in 2016, it pursued the development of “U-Check” in the English Windows OS through Step 3 development in order to counteract globalization. The following is a brief development progress summary of “U-Check”.

- Oct. ~ Sep. 2012: Program test development through the “IT utilization audit special unit Task Force” work.
- Dec. 2011 ~ Jan. 2013: Opinions on the education and usage of the program was determined (93% optimistic).
- Jan. ~ Feb. 2013: Development of program function improvement and manual.
- Sep. ~ Nov. 2016: By translating the previous Korean program into English, the program will be globalized to be convenient to use in foreign public institutions.

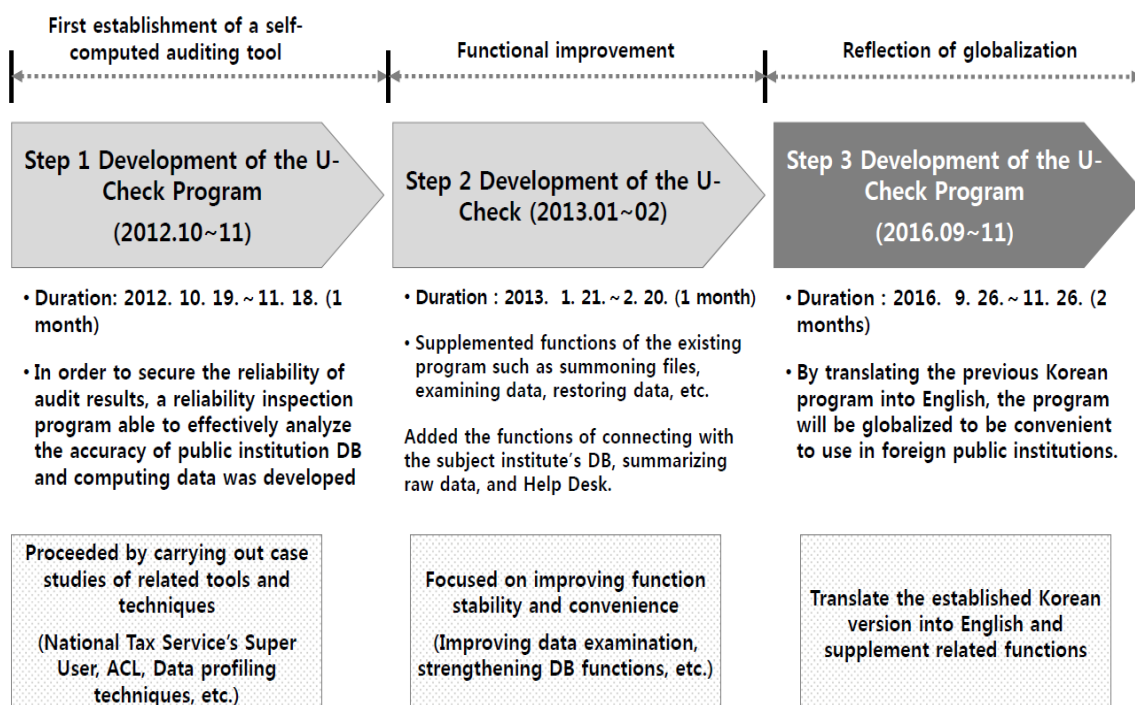


Figure 1. Development Process of "U-Check"

Below are the development team's reasons for naming the program "U-Check".

Famous symbol of the secret royal inspector during the "Joseon"¹⁾ is "Mapae". As well as the "Mapae", the secret royal inspector used to bring a book called 'Samok' and 'Yuchuck' that define official tasks. 'Yuchuck' is a ruler made from brass, and it aims at auditing local officials whether they perform their duties in fair ways on paying tribute, military, tax, etc. In the "Joseon", two 'Yuchuk' would be generally granted to those selected as secret royal inspectors by the king. It consisted of rulers with a length of 20cm or less. They comprised 5 yardsticks that were very commonly used in the "Joseon": The "Hwangjongchuk" which was used to manufacture musical instruments, "Youngjochuk" which was used to measure grains, "Pobaekchuk" which was used to measure fabric, "Yekichuk" which was used to manufacture goods related to ancestral rites, and "Juchuk" which was used to measure the length of land²⁾.

1) The Kingdom of Joseon literally "Great Joseon State"; also Chosŏn, Choson, Chosun) was a Korean kingdom founded by Yi Seonggye that lasted for approximately five centuries, from July 1392 to October 1897. It was officially renamed the Korean Empire in October 1897 (<https://en.wikipedia.org/wiki/Joseon>) .

2) The Board of Audit and Inspection of Korea (2016). "You must have a 'Yuchuk' if you're a secret royal inspector!, The Board of Audit Gallery's Relic Stories". *Quarterly Audit Publication*. Original Author: MiJoo Son, Public Relations Office, The Board of Audit and Inspection of Korea

This application is named U-Check, expecting to be used as a measurement for the tasks of the public sector, whether they are operated as required. In this reason, this application's English name, 'U-Check', is named after the brass ruler which is pronounced similar to Korean name 'Yuchuck'.



Figure 2. The shape of "Yuchuck" in the Joseon Dynasty

Program Features

"U-Check" application is based on MS Access, which has the ability to use simple methods to quickly handle variety of data. The functions of MS Access that are often utilized in audit works are packaged so that the users can easily apply them. However, the file format the MS Access uses to load is limited, so the program is improved to be able to load most of the other file formats.

- ◆ Excel
 - Pros. : Different forms of data can be processed, user-friendly program
 - Cons. : The speed of data processing is slow, data analysis cannot be done for large sized data
- ◆ Access
 - Pros. : The data processing speed is fast and large file sized can be handled
 - Cons.: Only DB format data can be analyzed, program is difficult to use

① Data reliability check for high accuracy of the audit result

The Data reliability checking for high accuracy of the audit result is basic function served by "U-Check". Its primary function is as follows.

- To Check the validity of social security number, license maintenance number, corporation registration number that are often used in comparison data
- To inspects for omission/duplication of unique numbers such as social security number or contract number
- To provide descriptive statistics that will check whether the contract cost is an singular value
- To Check whether the collected data are in the same form

② Conversion, analysis, and processing of collected data

When most of the data of same form are collected from variety of auditees, the collected data is easily appended into one file. In order to meet the purpose of the analysis, the field form of the collected data is conversed (number ↔ letter ↔ date), or is being processed using the four fundamental arithmetic operations. Implementing criteria after mutually comparing based on "matching key". The raw data are summarized and organized by tables and pictures to determine the work progress.

③ Maintenance and Security of the analysis results

The raw data, analysis logic, and analysis result that are applied to the ideas that are remained during the auditing, are saved on different files so that knowledge accumulation and data sharing is possible(data backup). Intermediate analysis results and personal information are protected by the login(password given) and uninstall functions.

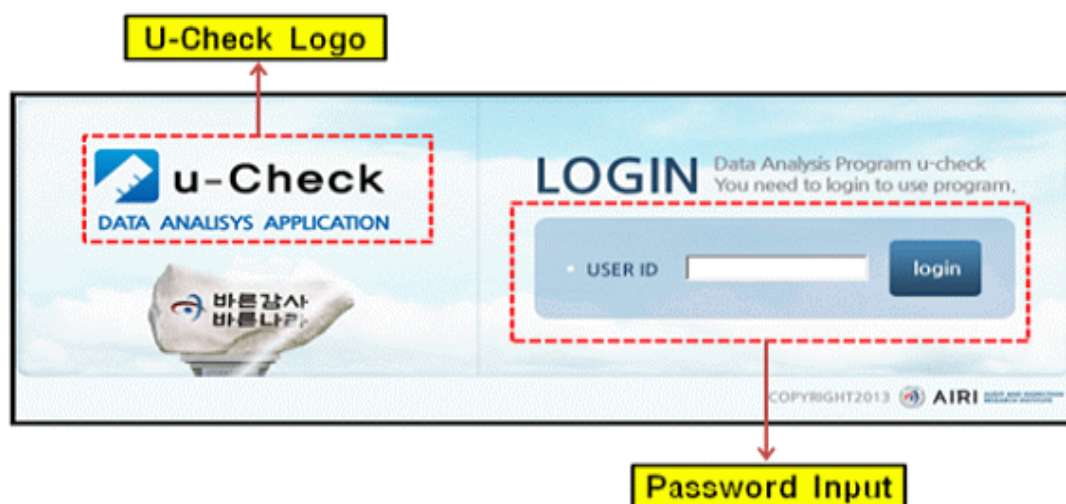


Figure 3. Initial Login Display of "U-Check"

Program's Key Functions

① Importing Files

To analyze the data in the "U-Check" program, as well as validate errors which may occur during the inputting process, such as social security numbers the destination file should be imported first. File Import performs the function of converting audit data, such as Excel, text file or a remote database table, into a database format for the program.

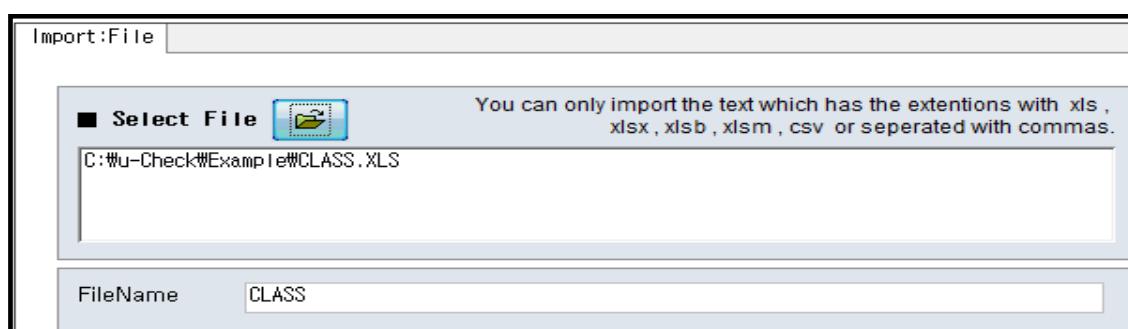


Figure 4. Configuration Display of "U-Check" for Importing Files

② Testing Data Reliability

"Testing Data Reliability" is a function that checks if the collected data is in the same format and if the data, which is used as the common key, is correct. This function can test file format, data value, duplication, and technology statistics in the [Testing Data] menu. Following table 1 shows detailed function of "U-Check"'s testing data reliability.

Table 1. Detailed Function of U-Check's Testing Data Reliability

Function	Details
Testing Data Form	Test consistency, and display unmatched data (Data formats can be added in the "Settings" function)
Testing Data Value	Test digit value on Social Security Number, Company Registration Number, Legal Registration Number and display input errors.
Testing Duplicate	Test whether there is a unique number that is redundant.
Descriptive Statistics	Test whether there is specific value in a particular data item through a data distribution.

③ Data Reconcile

“Data Reconcile” is a function that merges the two each other tables based on a particular field (common key), and sets the conditions for the merged each other table to derive results.

Company_L	Start_Date_L	Expiration_Date	Date_R	Company_R	Product_R	Price_R	Sales_Channel_L	Units_R	Contact_No_R	Reliability
JJ	2011-06-01	2012-06-01	2012-07-04	JJ	SUPA103	1,4	Retail	67	12-050555	
JJ	2011-06-01	2012-06-01	2012-07-06	JJ	DETA100	1,1	Retail	82	12-002351	
JJ	2011-06-01	2012-06-01	2012-07-12	JJ	DETA100	1,1	Retail	82	12-002351	
FF	2012-07-01	2013-07-01	2012-06-24	FF	PURA100	2,1	Online	142	12-002351	
FF	2012-07-01	2013-07-01	2012-07-04	FF	DETA200	1,2	Retail	141	12-003512	
FF	2012-07-01	2013-07-01	2012-07-04	FF	DETA200	1,2	Retail	141	12-003512	
II	2012-07-01	2013-07-01	2012-07-04	II	SUPA101	1,5	Online	30	12-050555	
II	2012-07-01	2013-07-01	2012-07-12	II	SUPA101	1,5	Online	30	12-050555	
KK	2011-11-01	2012-11-01	2012-07-12	KK	DETA800	1,3	Retail	157	12-050542	
KK	2011-11-01	2012-11-01	2012-07-12	KK	DETA800	1,3	Retail	157	12-050542	
LL	2011-11-01	2012-06-01	2012-07-13	LL	PURA200	2,2	Online	10	12-003512	
LL	2011-11-01	2012-06-01	2012-07-13	LL	PURA200	2,2	Online	10	12-003512	

Figure 5. Configuration Display of “U-Check” for Reconciling the Data

④ Analyzed Data Summary

With the “Analyzed Data Summary”, you can identify the characteristics of each type of data. Especially, multi-dimensional feature is unlike the one-dimensional analysis, in that rows and columns in the axial service function to obtain a summary value with respect to the specific field. For example, the multi-dimensional feature can calculate the average monthly salary based on department, as well as gender. The multi-dimensional analysis uses the data from rows and columns to calculate the sum, average, minimum and maximum, similar to the Pivot function found in Excel.

Name	Department	Age	Gender	Salary	ReliabilityTest
Britanni Bender	Human Resources	51	F	27000	
Samuel Ayala	Marketing	42	M	18750	
Shad Delacruz	Sales	42	M	12000	
India Gilbert	Human Resources	41	M	13200	
Ursula McConnell	Finance	41	F	21000	
Ryder Conner	Marketing	43	F	13500	
Germaine Kidd	Finance	51	F	18750	
Rhona Clarke	Finance	38	M	9750	
Maxwell Parker	Marketing	44	M	12750	
Isaac Wolf	Sales	38	F	13500	
Guinevere Key	Human Resources	39	M	16500	
Lani Sweet	Human Resources	42	M	13500	
Clark Weaver	Marketing	42	F	18750	

Figure 6. Configuration Display of “U-Check” for Analyzed Data Summary

Contribution and Future Task

Generally, the supreme audit institution deals with all general areas related to national administration and finance. Therefore, in order to draw a fair audit result, reliable and comprehensive analysis through gathering diverse material related to auditing and tying it in is mandatory. So auditors encounter numerous audit material spread across various institutions. They gather this material swiftly and conveniently, with a certain standard, to analyze it under diverse standards. In the case of Republic of Korea, many central administrative and public institutions that were concentrated in Seoul and the capital area moved to regional areas such as Sejong City after the Prime Minister's Office first moved there in September 14, 2012. Hence, auditors at The Board of Audit and Inspection of Korea that need to audit such institutions must often collect and analyze material from institutions located in diverse regions. Developers felt the need to develop a tool that could conveniently collect and analyze material for auditing, and "Yuchuk" can be said to be the result of such demand.

Needless to say, improvements in program functionality are constantly needed. Inconvenience and improvement factors of the operation process will be reflected in improving the program. While the program is developed based on legal auditing, statistic analysis function needs to be added, so that the analysis tool can be used to support progress audit.