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Parallel Bookkeeping Path of Accounting in Government Accounting System Based on Deep Neural Network

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ABSTRACT

When it comes to government accounting, "parallel bookkeeping" is a crucial technological solution for achieving the desired moderate separation and connection between the established financial accounting system and the budget accounting system. For most people working in government accounting, this is still somewhat of a novelty. The foundation of deep learning is an extremely complex neural network. Up to The neural network has been used in various fields recently, but its use in the financial sector is more comprehensive. the neural Financial accounting benefits greatly from access to the internet.

Introduction

The Government Accounting System (GAS) and Statements of Administrative Institutions Notice was published and disseminated in 2017 by the Ministry of Finance. In response to questioning from the press, it was first suggested as "bookkeeping." staff of the Department of Finance and Personnel There must be a period of adjustment for administrative institutions. As well as understand the principle of double-entry accounting. Since 2019, a new system of accounting for the government has been put into effect. If you want to help the vast majority of people in their daily lives and in their job, several studies on the topic of financial people, and academics have parallel bookkeeping: an exploratory investigation and started looking at the implementation of "parallel bookkeeping" by combining the Internet of Things and other technologies like the cloud and large amounts of data. However, no scientists have done extensive research on "parallel" and "deep" neural networks, the intersection of bookkeeping and the accounting profession. Despite the new government accounting system's widespread adoption, a parallel bookkeeping system has emerged. Researchers were forced to do extensive research as a result. Among them, Li J created a multitask deep convolutional neural network that can identify the presence of the target and target's coordinates and bearing with respect to the area of interest. For another, the recursive neuron layer is used in the identification of structural features, which increases complexity and the insignificance of various tasks in accounting [1]. Fiscal record-keeping John T.'s research system uses an Oracle back end and a Java front end. Web's supporting software programmed running in the background. It gives you useful for a variety of accounting tasks, both general and specific efficiency and effectiveness of other, analogous, automated procedures safety in the workplace [2]; Durgham M's research on the activity-based costing (ABC)

approach reveals that the directives of higher-ups, the presence of the accounting system, fierce rivalry, and a wide range of supporting activities are all genuine and operational in the world today. More reliable results may be obtained by using the ABC system. Data on prices [3].

Accounting Methods in Government Accounting System

In-Depth Neural Network Calculation Method. A deep \neural network is a sort of machine learning, which is\proposed based on the learning notion of the human brain. It may be referred to as deep learning as well. Essentially, it's a system that can acquire new knowledge. Autonomously, without human intervention following network preparation [7]. As a result, if it were implemented in the field of accounting, the complicated job may be sorted out and placed into a deep neural network to train the model.) The trained model may routinely gain knowledge to aid in the finance department's handling of complicated tasks. By financial large data source analysis, composition data for economic analysis and planning are broken down. With the use of statistical modelling, the transformation of economic judgement brought on by amalgamation of the Internet, large amounts of data, and AI. When compared to more conventional neural networks, deep neural networks neuronal system. Its method of instruction is the instruction of each individual layer, which might get rid of basic conventional neural network training, has difficulty. One of the main concepts behind deep neural network theory is that all in the network and training stages, unsupervised learning is used. Hence there is no need for any kind of physical intervention in the network training-layer, and so long as the necessary conditions are met, it may be processed automatically. As there is financial data input [9].

Figure 1 shows the input of the nth piece of financial data, denoted by in, and the output, denoted by I denoted by 1, 2, 3, 4, etc. (n + 1), where S is the output layer and Sn is the underlying structure. Financial data, iteration n; hy denotes the depth at which financial information is stored; YP is a tally of all output values. Then, we derive the learning procedure from the formula. In the form of a neural network. Under the condition that the input variable financial input layer data, the formula for its computation is as follows:

$$\text{Count}_1 = \sum_{i=1}^{n} i_n + \int Q_n, \qquad (1)$$

If Qn is the cutoff for the nth input and En is the output determined for that data, then the formula for En is as follows:

$$E_n = f(\text{Count}_1), \qquad (2)$$

$$f(x) = \frac{1}{M^x + 1}. \qquad (3)$$

The basic assessment formula of each layer's output financial data is shown in Figure 1 below.

$$h_{y1} = \sum_{n} i_n * n + G,$$

$$h_{y2} = f(x) * \frac{Q_n}{x_n} + h_{y1}, \qquad (4)$$

$$h_{y3} = h_{y2} + \sum_{s} \frac{S_n}{n}.$$

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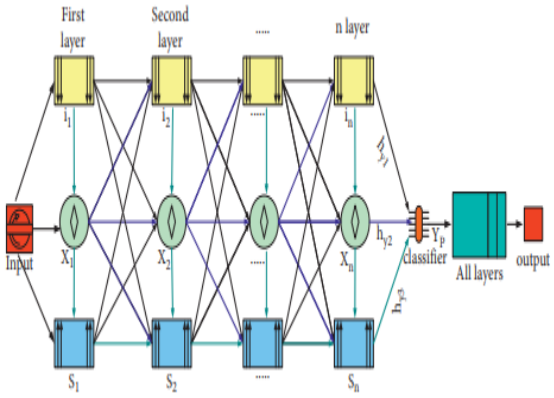
To get an overall score for the produced data, use the following formula:

$$Y_p = \left(h_{y1} + h_{y2} + h_{y2}\right) * n. \qquad (5)$$

In a deep neural network, the automated encoder takes use of the network's unique strengths; it might be thought of as a more advanced version of ANNs interconnected system [10]. For example, suppose that the artificial neural network's automated encoder network is not managed effectively, the final results will be the same as the initial financial data,



3 Figure 1: Structure diagram of deep neural network

Therefore the incorrect calculation.)E accounting has to be precise, particularly the financial accounting of administrative institutions.)erefore, the automated encoder in the deep neural network can remove such mistakes and learn and adapt to new data without human intervention. Remove the need for centralized monitoring by independently identifying inaccurate data. Financial tasks that are very complicated Figure 2 depicts an automated encoder. The multilayer structure of the deep neural encoder is responsible for automated encoding network. Once the multilayer automated coding has been trained, must need an additional classifier since it cannot categories the data itself hence the automated encoder may be used to categories the data. merely re-create the qualities of the supplied data, which (The use of a deep learning technique that Application of a neural network to the field of accounting is not only novel, but also an alternate route in the books, and a schematic of a The results of a deep neural network's data processing The approach employs multilayer, simultaneous processing and output at the same moment. There is a great deal of convoluted data to calculate how to best use it to make progress. Affectivity in the workplace.

Figure 2 depicts the internal workings of an automated encoder with two inputs, where Q1 and Q2 represent the data loads at the first and second inputs, respectively. When this information reaches the neural network, it will be distributed to each individual neuron. Layer two or three the values F, G, and H are associated with the weights of the respective neurons. Both I and j, and the information from the input port will be sent into me. The internal structure of each kind of neuron is different Since each neuron is unique, it's necessary to have a certain quantity of data to Since the output of each neuron is determined by a unique set of equations, Here is the formula for determining W:

$$W_1 = Q_1\left(\overline{D_1} * E_1\right)\frac{Q_2}{4} * F,$$
$$W_2 = Q_1 * \sum_{G} Q_2\left(Q_2 + E_2\right),$$
$$W_3 = \frac{H}{Q_2} \times \left(E_3 + D_3\right), \qquad (6)$$
$$W_4 = \sum_{2}^{I} \frac{Q_1}{D_4 / E_4 * Q_2}.$$

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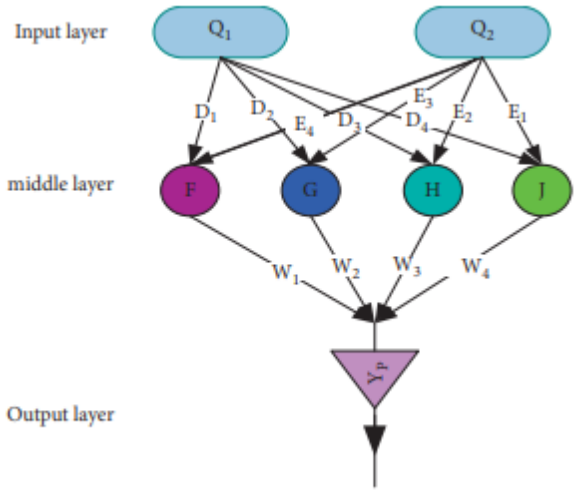

1 Figure 2: Simple structure diagram of automatic encode

When W is calculated, a mapping layer appears in Figure 2.)Is mapping layer is just like a self-checking system that can map any information,...and a residue will exist to encourage data backpropagation.) If we transform the residual into a function, then

$$\vartheta(F \longrightarrow J) = \sum_{Q}^{D} \int_{1} \frac{Y_P}{G} + \sqrt{W}(1 - H), \qquad (7)$$

Where Yp is the total data output amount. Though there is a built-in encoder in it's still necessary for a data memory to exist for the deep neural network. A must-have for data analysis and categorization with large data. Whereas W is the weight of the neural network structure, H is the activation function. Is a lot of money information A deep neural network must be to fully appreciate the significance that networks play in the field of accounting, it is necessary that we pool our large quantities of data. When it comes to storing, managing, and analyzing information, "big data" quantitative method. With its help, the intelligence of a big a large amount of financial information. Thus, the data may be properly categorized. Before information is sent into the deep learning system, the classification of a neural network is unnecessary.

The likes of which may save a lot of unnecessary expenditures of time and money [11]. For the appropriate platform to be built, it is necessary to use both big data and deep neural networks. Big data is capable of handling the former task. To carry out topic modeling, text categorization, and data mining on the details needed to compute fiscal data arriving to the system.) Framework for operating massive data and the power of deep neural networks is seen in Figure 3.

Since the data first passes through the deep neural network, we may store it in the big data storage system as a fingerprint and label it "M." sum of information flowing into the big data system is Yp; and the data quantity at each tier is hyi hy2 hy3. To break up the deep neural network into manageable chunks of information, in addition to the fingerprint of the data acquired before diving into the big data, Therefore, the formula for determining the total amount of data blocks of Ny1 is

$$N_{y1} = \frac{hy1}{n} * \sum_{i_n} Y_{P}, \qquad (8)$$

$$N_{y2} = \frac{h_{y2}}{n} \oint N_{y1} * \sum_{x_n} Y_{P}. \qquad (9)$$

To see why Ny1 must be accounted for in formula (9), consider that in a deep neural network, the input layer's book data will be sent to the hidden layer, where it will be used in the computation. Once again, this time to the input layer's data block compute Ny2

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where xn is the nth piece of input data. Depth concealing. The algorithm for Ny3 may be understood by comparison as follows:

$$N_{Y3} = \frac{h_{y3}}{n} \oint N_{y1} \sqrt{N_{y2}} * \sum_{s_n} YP, \qquad (10)$$

Where Sn is the nth piece of data sent to the layer below it. Some fingerprints provided by the input data are known to coincide because of formulae (8, 9, and 10). In order to alleviate future stress caused by an abundance of redundant data in a deep neural network, Big Data will automatically corrupt this information. Hence, the algorithm of the end result (data analysis) what follows is information included in block n:

$$N = \left(\frac{N_{y3} + N_{y2} + N_{y1}}{3n} \right) * \sqrt[3]{YP}. \qquad (11)$$

To process accounting vouchers, accounting accounts and financial statements [12] is part of the accounting process, which is also known as the financial processing procedure. The most popular three distinct types of bookkeeping are in frequent use. Filing systems for accounting vouchers, detailed accounting voucher processes and account tally sheet accounting methods [13].

Road to "Parallel Accounting." The purpose of so-called parallel bookkeeping (the backbone of the government's accounting system) is to accurately portray the government's financial information and budget implementation information and to correctly segregate the government's operational and financial activities.

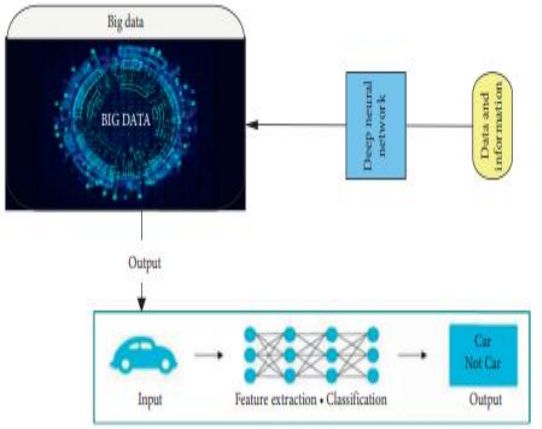

Figure 3: Operation structure of big data and deep neural network.

Accounting for money and figuring out how much money you can spend. The government's accounting method will result in more information about the budget being made public, making budgetary matters easier to understand [19]. The dual system concept states that in order to properly manage a department's budget, two distinct products must be produced. Cash flow forecasting and financial accounting and commercial outlays.

The purpose of this research, which explores the use of a deep neural network to construct a "parallel accounting" route, is to eliminate the time-consuming tasks associated with financial accounting, and create an alternative financial trail. Financial reporting often requires needing several accounts in order to be accounted for. Moreover, financial accounting and budget accounting are essential for every single account. By using the parallel accounting route, one Completed budget and financial accounting for in one account, but it must be done again for all other accounts method, leading to tedious bookkeeping.) deep Due to the neural network's ability to process input in a hierarchical fashion, we may create one

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that allows simultaneous "parallel bookkeeping," or use of several accounts, It's time for a deep neural network's structural blueprint. Figure 4 depicts the "parallel bookkeeping" route. The accompanying diagram illustrates the basic framework of Together with "parallel bookkeeping" and a shallow deep neural network, in keeping with Figure 4. The single account with merely a route of parallel bookkeeping, parallel accounting this combined DNN can do parallel accounting in the areas of financial accounting and budget accounting. With respect to the necessary records that are) the multilayer functioning of Multi-account operation of the deep neural network is possible at simultaneously, which may cut down on time spent on routine tasks.

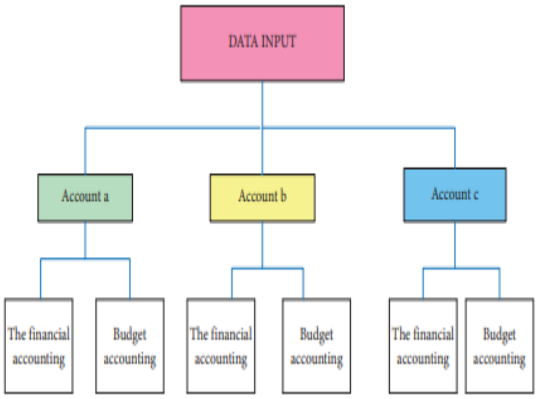

Figure 4: Basic structure diagram of the combination of deep neural network and “parallel accounting” path.

Experiment and Result Analysis of “Parallel Bookkeeping” Path Based on Deep Neural Network

Constructing Experiments. Study 1: A Comparison of Parallel and Double-Entry Bookkeeping for Efficiency. We begin by timing the accounting tasks needed by a bank and comparing them to the approaches of parallel bookkeeping and repeated bookkeeping. Each case accounts that need to be computed are shown to be found in Table 1. Follow the method of parallel bookkeeping in accounting, bank's deposits, loans, investments, revenue, and other money at both the financial accounting and budget accounting levels using double-entry bookkeeping time, and keep track of how long each takes using a timer. In order to compare the two methods of bookkeeping,) e time that each one would take Table 2 displays the results for each category. Every time the accounting staff does a time-cost analysis throughout the trial, they will discover that the the parallel bookkeeping accounting method is more efficient than Use of two journals in accounting. We need additional data to confirm this trend. Figure 6 illustrates this intuitive understanding.

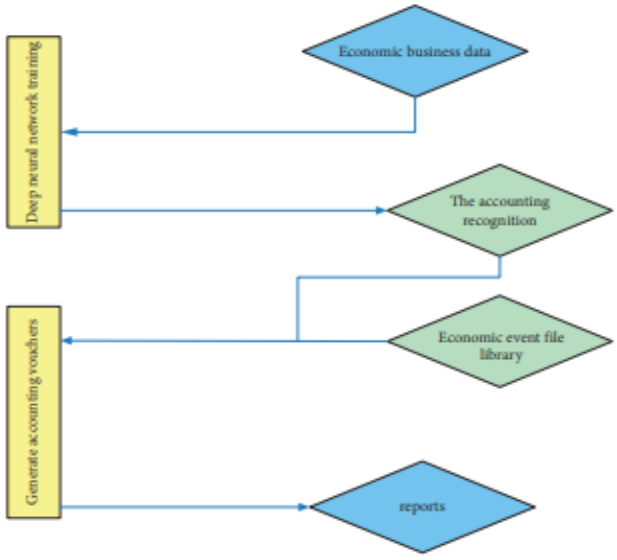

Figure 5: Flow chart of accounting element recognition

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In the second experiment, we evaluate how well the parallel bookkeeping system performs in comparison to the traditional accounting approach.

Economic business items	Time for parallel bookkeeping (unit: h)	Double-entry time (unit: h)
Deposits	1	2
Loans	1.3	3.4
Investment	0.7	2.2
Borrowing	0.5	1.4
Income	3	4.7
Other payments	2.4	7
The total time	8.9	20.7

Table 1: Schedule required for parallel bookkeeping and double entry bookkeeping (unit: h).

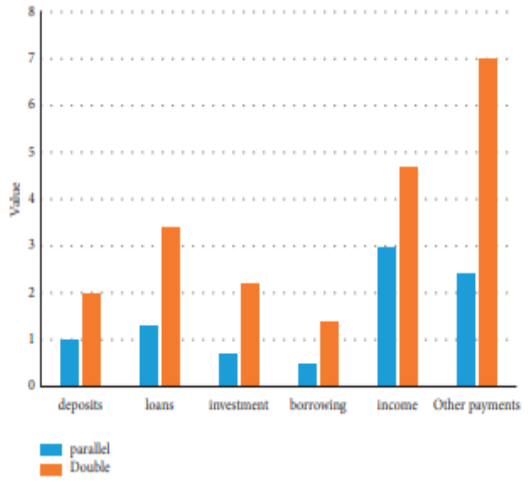

Figure 6: Time comparison chart

We continue to use the bank's chart of accounts while we evaluate the efficiency of the parallel bookkeeping accounting approach using a deep neural network. In this study. When dealing with the bookkeeping for a substantial sum, financial data is notoriously imprecise, and even with a lot of double-checking, there will be mistakes. Check. When an error occurs, recompilation of all accounts is required, which might take a long time. Hence, while optimizing productivity, we may focus on making sure the the reliability of account verification and the absence of excessively process. Therefore, in order to determine the precision of the two routes, the relevant accounts are the outcomes of the relevant accounts previous verifications of which exist. It's expected that after the books are may then be compared to the information already on file. Estimate the amount of time needed to compute accounting precision.

Figure 7 is a graphic representation of this conclusion. under the influence of a neural network and parallel accounting this paper's accounting technique, the broken line's upward tendency as compared to the same square statistics alternative techniques of accounting It's possible to withdraw funds from the savings account by Looking at the accounting for this article, we observe that the time spent When compared to the alternative method of accounting, This paper's method of accounting is more efficient than around 60% less than the other accounting route. To that end, let's examine figuring out how much money is needed for anything else is tough. Combination of a deep neural network with parallel bookkeeping network. Learning takes over in the after training through autonomous an artificial neural network is capable of doing calculations on its own. Adding this technique of computation to the procedure, instead than manually comparing each account, as in the analogous thus, the accounting approach in this work is more effective than the conventional bookkeeping method. Course of parallel accounting. The two are laid forth in Table 3 the two are compared in terms of their accuracy in Table 4.

Table 3: Time comparison between new accounting path and parallel accounting path in this paper (unit: h).

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Economic business items	Time for parallel bookkeeping (unit: h)	Time of new accounting path (unit: h)
Deposits	1	0.3
Loans	1.3	0.5
Investment	0.7	0.2
Borrowing	0.5	0.1
Income	3	1.5
Other payments	2.4	1.1
The total time	8.9	3.7

Table 4: Comparison of accuracy of new accounting path and parallel bookkeeping path in this paper

Economic business items	Parallel bookkeeping accuracy (%)	Accuracy of new accounting path (%)
Deposits	73.2	87.7
Loans	80.6	90.3
Investment	79.5	89.66
Borrowing	100	100
Income	84.35	94.6
Other payments	95.3	97.55

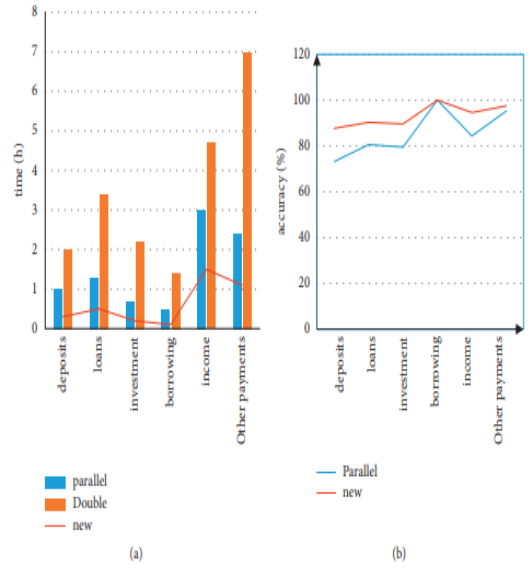

Figure 7: Comparison of the efficiency and accuracy of the accounting method and parallel bookkeeping in this paper: (a) time comparison chart and (b) efficiency comparison chart.

Discussion

This article uses a deep neural network to analyze the parallel bookkeeping route accounting approach, which has been shown to increase productivity for finance staff. Use of appropriate formulae is essential in accounting. It takes a lot of time to do bookkeeping and other manual work. Resulting in poor performance. Despite the similarities, this method is manual accounting, although it is more effective than the prior double-entry system. Combining the parallel processing capabilities of a deep neural network Thus, the neural network may be programmed with all the formulas. Network. After being trained, the system can do calculations on its own. The accounting voucher is now available. Manually so as to keep the validated information while the authors of this study have used the use of deep neural networks and large amounts of data, the system will intelligently process any text and data entered into it. Categorized and encoding they are possible; thereafter, a parallel accounting method will be implemented for statutory reporting. Deep learning's results in action. According to the results of the paper's experimental research, even if a parallel accounting route using a deep neural network the network we've built in this study is not likely to be perfect. Improves upon older forms of bookkeeping every single kind of bookkeeping is irrelevant. Still, the you may put a deep neural network to work in any investment banking, financial hubs huge amounts of information, extensive accounting records, and comprehensive financial records accounting. The reason why this paper's experiment is so important is entails not just the accounting of massive amounts of data, but also the precise information, yet the accounting of Double-entry accounting requires a great deal of information from its users. Time and effort spent by financial experts to set up parallel

accounting study in this article is a deep neural network-based pathfinder. Appropriate for any kind of data tally [25].

Conclusions

Using the parallel bookkeeping approach developed in this study and predicated on a deep neural network, all computation formulae are input into the predicate layer of the network. using a sophisticated network of neurons that can examine and sort data and information) then said data and information are Big data categorizes and enters the parallel accounting system route based on a neural network deep enough to handle financial data The experiment shown above demonstrates the method of parallel accounting using a deep neural network constructed in this study is more expensive, both in terms of time and accuracy, than the older, more conventional approaches of accounting. This article concludes that the accounting route it examines is viable and may serve as a resource for the efforts of the finance team.

References

[1] J. Li, X. Mei, D. Prokhorov, and D. Tao, "Deep neural network for structural prediction and lane detection in traffic scene," IEEE Transactions on Neural Networks and Learning Systems, vol. 28, no. 3, 703 pages, 2017.

[2] T. John, "From governmental accounting to accrual accounting," Indian Railways, vol. 61, no. 11, 82 pages, 2018.

[3] M. Durgham, "Availability of the fundamental factors for implementing activity-based costing(ABC)systems in the Palestinian governmental hospitals in gaza strip(field study)," Journal of Economic&Administrative Sciences, vol. 23, no. 1, pp. 32–76, 2016.

[4] S. Park, "A study on the applicability of activity-based costing in government accounting: focusing on sancheonoe festival," Journal of Local Government Studis, vol. 29, no. 1, pp. 57–83, 2017.

[5] M. Suhwan, S. Hong, and M. Yeo, "Enhancing the accounting record keeping practices of advanced agricultural managers," Korean Journal of Animal Science, vol. 44, no. 1, pp. 133–143, 2017.

[6] J. Yun, S. Jun, and D. Lim, "A comparison of government accounting audit system of U.S. And government accounting examination system and review system of South Korea," Korean Policy Sciences Review, vol. 21, no. 1, pp. 79–100, 2017.

[7] M. Gong, J. Zhao, J. Liu, Q. Miao, and L. Jiao, "Change detection in synthetic aperture radar images based on deep neural networks," IEEE Transactions on Neural Networks and Learning Systems, vol. 27, no. 1, pp. 125–138, 2016.

[8] J. N. Meegoda, T. M. Juliano, L. Potts, C. Tang, and T. Marhaba, "Implementation of a drainage information, analysis and management system," Journal of Traffic and Transportation Engineering, vol. 4, no. 2, pp. 165–177, 2017.