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# **The Fourth Industrial Revolution: The Present and Future of Accounting and the Accounting Profession**



## *Summary*

It has been proven that in the future accounting will not only survive in the economy as the base of information and a regulatory institution, but with the help of information technologies, it will even improve and help eliminate shadow economy. The accounting profession will certainly undergo changes, and will increasingly make use of software in practice.

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*Statement of the problem.* In scientific circles it is discussed that the fourth industrial revolution is looming in the economy and the society, and will make a lot of jobs redundant, including accounting. Is it true that the accounting profession will no longer be in need? For over five centuries this profession has had an important role in the social and economic system of every country. Accounting regulates social and economic relations and provides the necessary information. Seeking to know the future of accounting as a profession, first the current place and role of accounting in society and the economy needs to be considered.

*Analyses of research papers* on the place and role of accounting as a social-economic institution, the role of accounting information in the economy and changes in the profession under the influence of information technologists are in the focus of atten-

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tion. The stakeholders in this issue include Y. Hrynchyshyn,<sup>1</sup> O. Kantsurov,<sup>2</sup> S. Kuznetsova,<sup>3</sup> M. Medvedev,<sup>4</sup> N. Tsvyetkova,<sup>5</sup> V. Zhuk<sup>6</sup> and the authors of this article.<sup>7</sup> However, so far, none of the studies has raised the question of the role of accounting in the economy in the perspective of the fourth industrial revolution.

A. Borg<sup>8</sup> and K. Schwab<sup>9</sup> reveal the future ahead of us: a radical transformation in employment, including the disappearance of numerous jobs, and the resulting decline in tax revenues. At the same time, revolutionary changes in the economy will undoubtedly improve information technology, boosting the retail sale of goods, shifted towards online commerce. This will again reduce both taxes (including value added tax) and the number of jobs (and consequently, taxes on wages and social charges on salaries).

In Borg's opinion,<sup>10</sup> the fourth industrial revolution will dramatically change demand for employees: highly skilled and well-paid employees and unskilled and low-paid workers will be in need, and this will lead to the elbowing out of the middle class from the labor market. Currently this is the largest class in society and the guarantor of democracy in the world, so its displacement would cause an increased number of problems in society. All the above-mentioned factors will have a massive impact on the role of accounting, and thus the accounting profession, which has had an important role in the economy for over a century. This is the reason why the future role of the accounting profession in the modern economic system needs to be explained.

*Purpose of the article:* To show the current and future significance of accounting in the economy under the conditions of the fourth industrial revolution.

*Results of the research.* In order to reveal the future role of accounting, first of all its current role needs to be identified. Accountancy has a multiple role in the socio-economic system: on the one hand, it shows the essence of the facts of economic life and ensures their legal evidence, on the other, it has a function in every sector of the economy (industry, agriculture, construction, all types of transport, trade, tourism and the hotel business etc.), thirdly, it offers the opportunity to reveal the efficiency of economic activities, in the fourth place, accounting is a means to adjust the legal aspect of business processes, it confirms their legitimacy and feasibility; creates a relationship between the economy and law in the process of commercial activities, and finally, accounting is organized by a targeted process of obtaining and transmitting information about the facts of economic activities.

These multiple roles of accounting in the economy can be classified in two groups: on the one hand, it is an information base that satisfies the requests of users to information about the activities of businesses; and on the other hand, it is one of the most important institutions of socio-economic system, through which the economy established the "rules of the game", that must be followed by all entrepreneurs and businesses. These units can be studied in two ways: the role of accounting in the modern economy and the role of the accounting profession in the future.

*The role of accounting in modern economies.* As it is well-known, the accounting information covers most of the information system of an enterprise, and it is used by the specialists of the administrative apparatus for planning, economic analyses, au-

ding, and the compilation of various forms of reporting. Accounting controls the performance of the targets during the reporting period and provides information for planning and forecasting economic development. Economic analysis is based on accounting data, and managers use them to study the reasons for deviations from the plan, identify reserves for the improvement of efficiency in business activity, and check compliance with the legislative regulations governing business relationships. Accounting data are also used for overseeing development in a country's economy; and accounting indicators are widely used for statistical generalizations.

For this reason, the largest part of the information system of a company comprises accounting information on the receipt and use of material and financial resources and production processes, and on implementation, remuneration, costs and results of activities in accordance with the requests of the various users. Accounting information is available for a large number of users: the owners, lenders, contractors and representatives of government authorities, the management personnel of the company, independent analysts and auditors, etc. Scientific literature classifies users by their features. For the purpose of this research, the users of accounting information are divided into an external and internal group.

External users are normally outsiders of the enterprise, but have a direct financial interest in its economic activities (business). They include potential investors, creditors, suppliers, banks, financial and insurance companies. In addition, there are external users who have an indirect interest in and also have a significant impact on the business activities of the enterprise. These include the following institutions: the tax office, social structures, suppliers, lenders, banks, etc.

The second group of users of accounting information are internal users, who use this information to regulate business at the enterprise. They include: representatives of the company administration, who are responsible for the objectives of the enterprise, budgeting and funding units; internal auditors and the senior management, including and company owners.

The various users have completely different interest. The auditor interested in the financial statements of the company; the tax office is interested in formation of the information about the objects of taxation; company employees want to know their wages; investors want to know methods and techniques of obtaining profit indicators and calculating dividends; lenders are interested in debt repayment terms, etc. They request accounting information for various kinds of statements – financial, tax, management, statistics, etc.

The vast majority of requests are made according to the requirements of the institutions established in the form of rules that regulate the procedure of drawing up and issuing reports. The rules of higher-level institutions are collectively called “regulators”. They represent at least three levels:

Level 1: legislative regulation set out in acts.

Level 2: regulation according to the rules and the resolutions of the Cabinet of Ministers, ministries, agencies, departments.

Level 3: regulation set out in rules of the company leadership.

Through legislative acts, the institutions acting as regulators on the first and second levels (international institutions and the Ministry of Finance of Ukraine) require market participants to compile and submit financial statements.

In Ukraine the first level is represented by Act No. 996-XIV of 16 July 1999 “On Accounting and Financial Reporting in Ukraine”,<sup>11</sup> amended each year, and by Act No. 2755-VI of 12 February 2010 (Tax Act), as amended for the last time on 1 July, 2016.<sup>12</sup> These acts established the “rules of the game”, in other words, the rules governing accounting and financial reporting in the first case, and tax reporting to the appropriate users and institutions in the second.

The second level is based on the Finance Minister’s Decree “On accounting and financial reporting in Ukraine”, which sets out the accounting rules of drawing up financial statements according to international financial reporting standards and the domestic accounting standards developed on the basis of international standards. Every standard specifies rules for the balance sheet, rules for assets, liabilities, cost accounting, etc.

One of the most important regulations lays down the rules of the chart of accounts and the accounting instructions on its use, and regulates the accounting and reporting activities of internal users (and external – IFRS users). The chart of accounts is the current list of accounts that reflect the movement of assets, liabilities, funds, debt, etc. for reporting purposes.

The third level of the institutional regulation of accounting and reporting comprises the rules of accounting the enterprise adopts – i.e. internal regulations. This accounting policy, discussed elsewhere by the authors,<sup>13</sup> sets the requirements of accounting for the company’s internal users. These requirements are based primarily on the rules the first two institutions, which serve as a basis for the selection of certain techniques (except for the compulsory tax reporting rules) and forms of accounting based on the acts and characteristics of the company and reflects the company’s accounting policy, which should also provide information on the higher-level institutions, external users and management of the enterprise.

This is due to the fact that the accounting information must always contain an institution to control enterprise activity and another one (meant for internal users) used for forecasting, planning, internal control and the regulation of the deviations.

*The role of accounting in the future.* Will the management need accounting information in the future just as today? Only the accounting system has tools or methods for creating such information. The four accounting methods (documentation and inventory, assessment and costing, bills and double-entry, and balance and statements) serve the observation of the facts of economic life through data collection, measurement (evaluation and calculation), registration, breakdown, classification and generalization (in the accounts) and the synthesis of data (balance and reporting).

These methods, applied for about five centuries, are expressed in a mathematical language that enables translation into a modern digital language. Thus, information technologies can provide efficient, modern methods of accounting. These methods are and will be used under any conditions in the course of the development of society,

including by the conditions of the fourth industrial revolution. Only accountants will be able to apply these techniques to create the information necessary for users.

Such accounting information will always be created on the basis of primary documentation. The latter contains information about the actual condition of the enterprise or commercial complex, firm or company on a given date. Accounting establishes an informative model of the business's economic activity, as part of the uniform information system of enterprise management. The center of this system is accounting, which focuses on the information about the actual state of the functioning of the enterprise. The accounting system allows the representation of the company in a way that is convenient for making management decisions. The accounting system translated into an information technological system works efficiently. It is very important in the development of the social and economic system, since it carries transparent information about all the transactions.

However, the further development of information technology in accounting and the economy may reduce the volume of the shadow economy, also under the conditions of the fourth industrial revolution, using increased requirements or "rules of the game" applicable to the information entered into the accounting system. The new rules will compel participants to record all the information in the system of accounts in an operative and transparent manner that ensures control the relevant institutions. This will contribute to the reducing the shadow economy, on the one hand; and enables the automatic prevention of unwanted deviations or the regulation those who already have, online. This development will contribute to further improvement in the technical equipment and information technology, which provide the basis for the following requirements:

- information about any business operation (in new information technologies these are called transactions) must be included in the accounting system through special techniques that ensure efficiency;
- these technical means must be combined in a coherent network, access to which will be representatives of the enterprise management and the controlling institutions;
- the network should ensure transparency of information, which is only granted to any economic transaction, it will immediately appear in a computer network and can be controlled;
- all business transactions are carried out in a transparent manner, the possibility to make payments solely on cash basis by enterprises and citizens is excluded, as everyone has a bank account and an electronic card;
- these rules or institutions should compel enterprises to transfer all payments in non-cash form;
- all trade points pay the population in a non-cash form, as everybody will have bank cards. Any trading network has to be equipped with terminals for the calculation.

The institutions that control enterprises will be able to collect and generate accounting information about the enterprise independently, on the basis of the operating data the enterprises collect and accumulate in their servers. The controlling

bodies will be able generate reports using standard algorithmic procedures. State institutions, in particular the representatives of tax organizations can not only periodically compile statements about businesses, but will also be able to exercise operational control over the economic activities of the latter. This will facilitate technical support and communication technologies that give great opportunities to work with information in an operational mode, as every economic transaction is immediately recorded in the system as soon as it is conducted, and through the internet it is transferred to the users of the system. Thus the global network of the internet allows users to work with databases anywhere.

*The role and place of the accounting profession in the future.* Under the new arrangements, the accounting profession may be modified, as accountants may no longer sit in offices, since the latter will be replaced by virtual offices. As a result of a massive development of information technology and in the internet, one will only need to turn on the computer and go online. This new accounting office model is highly beneficial not only for employees, but also employers: there is no need to rent an office, buy furniture, computers, telephones and other equipment. Special programs and services can efficiently monitor the performance of remotely working employees. Telework is the inevitable future.

However, there are also more radical approaches to change in this profession. According to E. Ljubjashheva, such changes will affect financial analysts, investment auditors, credit inspectors, financial controllers, professional investors, traders, specialists in the international standards of financial accounts (MSFO) and financial consultants.<sup>14</sup> In M. Medvedev's opinion, the accounting profession will be divided into two professions: the accountant-notary and creative-accountant.<sup>15</sup> Accountant-notaries will be required to ensure the conditions of permanent agreements, which will become an important target in future computer accounting. More specifically, in addition to the typical transactions required by law, accountant-notaries will be able to conclude tasks related to atypical agreements. The author refers to transactions that are not necessarily conformant with the regulatory provisions, and only accountant-notaries will be able to correctly handle agreements proposed by the accounting system.<sup>16</sup>

Creative accountants, on the other hand, will implement creative of accounting, beyond official accounting, which includes the proposed terminal that will provide data for analysis, control, planning or regulating a company's internal activity. According to the author of the concept, creative accountants the highest standard will have a special place in society.<sup>17</sup>

Thus, the complete computerization of accounting will lead to the abandonment of the use of modern accounting staff, which will be replaced by various algorithms, applied with the most recent technical equipment. Current accountants will be replaced on accountant notaries and creative accountants. Obviously, this will cause a revolution in the training of the accounting staff. Perhaps, in such circumstances accountant-programming will be a more marketable profession.

However, in the future, the fourth industrial revolution will force programmers combine their programming knowledge with accounting, in order to ensure a place

for themselves in the labour market. In any case, it is important to specify the algorithms for information to any time and any users via the Internet could independently receive the necessary data from the accounting information system. In the future in addition to programmers and accountants, all other experts who need accounting information for their own purposes will have to be familiar with these algorithms. They should be able to separate that information from the general of the array of information, use it for evaluation and analysis, control and regulation of the activities of the enterprise or for other purposes.

This is why in the future the acquisition of accounting and programming knowledge will be a necessity for all the professionals in the economy, and all will be compelled to use accounting information.

*Conclusions.* Firstly, examples evidence that the fourth industrial revolution has not displaced market accountants, although their number may have significantly decreased. Information technology can completely change accounting, but in most cases the methods of collecting, recording, summarizing, systematizing and detailing information will remain unchanged.

Secondly, in the future the role of accounting as an institution through which governments establish rules to regulate the economy will not be changed.

Thirdly, the rapid development in technical equipment and information technologies will require market participants to enter their data in the accounting system and thus the shadow economy will be completely eliminated.

## NOTES

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