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Khalleefah Ahmed Mohammed Saed,
Postgraduate student
Accounting and business consulting department,
Simon Kuznets Kharkiv National University of Economics

Халліфах Ахмед Мохаммед Саєд,
аспірант кафедри обліку і бізнес-консалтингу,
Харківський національний економічний університет імені Семена Кузнеця

FORMING THE INFORMATION SPACE OF CONTROLLING WITHIN ENTERPRISE MANAGEMENT

Khalleefah A.M. Forming the international space of controlling within enterprise management. The necessity of using strategic management accounting and the controlling system has been proved based on the provisions of fourth industrial revolution. The purpose of this article is to create an enterprise's integrated accounting and the controlling system as a combination of management accounting, internal audit, and predictive analytics subsystems. The internal structure and the interconnection of an integrated accounting and the controlling system with the different levels of enterprise management hierarchy have been given. The project structure for accounting organizing has been substantiated. The article made an emphasis on expanding the analytical and predictive capabilities of strategic management accounting. The methodical approach to create a list of accounting nomenclatures based on the use of the enterprise architectural model has been substantiated.

Key words: controlling, information space, internal audit, accounting and analytical support, management, decision-making.

Халліфах А.М. Формування інформаційного простору контролінгу в менеджменті підприємства. Шляхом орієнтації на досягнення четвертої промислової революції доведено необхідність використання промисловими підприємствами комбінації стратегічного управлінського обліку та системи контролінгу. Метою статті постало створення інтегрованої системи обліку та контролінгу на підприємстві. Доведено доречність розгляду такої інтегрованої системи як комбінації підсистем стратегічного управлінського обліку, внутрішнього аудиту та інструментів прогнозної аналітики. Запропоновано внутрішню структуру завдань та визначено взаємозв'язок інтегрованої системи контролінгу з різними ієрархічними рівнями управління підприємством. Обґрунтовано структура проекту з організації впровадження інтегрованої системи контролінгу, особливістю якої є застосування спірального підходу до розробки й реалізації проекту організації. Дана пропозиція дозволяє максимально задовольнити інтереси всіх зацікавлених в роботі системи контролінгу осіб. У статті зроблено акцент на розширення аналітичних і прогностичних можливостей стратегічного управлінського обліку. Обґрунтовано методичний підхід до створення переліку облікових номенклатур, заснований на основі використання архітектурної моделі підприємства. Доведена необхідність використання як інструментів інтегрованої системи контролінгу сучасних підходів до ведення облікового процесу, таких як бережливий облік (Lean-accounting) та облік проходу (throughput accounting), що відповідає зміні управлінської парадигми, привнесеної теорією обмежень. Такий підхід дозволив визначити особливості організації стратегічного обліку витрат, як однієї з головних компонент інтегрованої системи контролінгу. Досліджено проблему запитів користувачів облікової інформації та запитів зовнішніх та внутрішніх користувачів. У якості можливого варіанту вирішення даної проблеми запропоновано розширення облікових номенклатур ймовірнісними характеристиками. Доведено, що залучення інструментів предикативної аналітики має орієнтуватися не стільки на відповідні показники попередніх періодів, скільки на оновлення порядку обліку господарських операцій, на основі який формуються важелі управлінського впливу.

Ключові слова: контролінг, інформаційний простір, внутрішній аудит, обліково-аналітичне забезпечення, менеджмент, прийняття рішень.

Халлифах А.М. Формирование информационного пространства контроллинга в менеджменте предприятия. Путем ориентации на достижения четвертой промышленной революции доказана необходимость использования комбинации стратегического управленческого учета и системы контроллинга. Целью статьи стало создание интегрированной системы учета и контроллинга на предприятии как комбинации подсистем управленческого учета, внутреннего аудита и прогнозной аналитики. Предложена внутренняя структура и взаимосвязь интегрированной системы контроллинга с различными иерархическими уровнями

управления предприятием. Обоснована структура проекта по организации бухгалтерского учета. В статье сделан акцент на расширение аналитических и прогностических возможностей стратегического управленческого учета. Обоснован методический подход к созданию перечня учетных номенклатур, основанный на основе использовании архитектурной модели предприятия.

Ключевые слова: контроллинг, информационное пространство, учетно-аналитическое обеспечение, внутренний аудит, менеджмент, принятие решений.

Formulation of the problem. Decision-making is an essential component in modern economic research and plays a crucial role in ensuring the efficiency of enterprise operations. Nowadays, the business environment becomes more complicated with accelerating changes in customer behavior and production method. Meanwhile, every economic entity has to be involved in communication and cooperation with a tremendous amount of subcontractors, suppliers, researchers, banks, government representatives, etc. Tightening competition on the market leads to a different type of production cooperation chains, with a vast amount of hierarchy levels, appearance. Each of the given examples of modern business transformation causes increasing in the amount and quality of information, which is required from an enterprise decision-making system. Not all of such information could be achieved from the enterprise accounting system. Moreover, effective decision-making and enterprise functioning also require confidence in decision implementation. That is why the internal control system becomes very relevant for enterprise management. Although the relevance of internal control is not questioned, ensuring such control effectiveness is only possible in case of its integration with management accounting and strategic management. Given this, the problem of enterprise integrated controlling system forming becomes very relevant and requires detailed consideration.

Analysis of recent research and publications. A considerable amount of literature has been dedicated to solving the problems of internal control organizing. Some authors in this case use the «controlling» concept. The classic book here is D. Hahn's [1] work, which made a basis for researches in the field of controlling («Controllingkonzepte» in German) and also created many contradictions. In this case, the lack of uniformity in the understanding of controlling concept has to be noticed, especially it the accounting-oriented researches, written in English. The «controlling», in D. Hahn's [1] explanation is an integrated management support system. The support system of this kind consists of areas such as risk management, information gathering, key performance indicators evaluating, tactical and operational planning implementation, etc. From the modern point of view, it is necessary to add to these areas the predictive analytic system, elements of artificial intelligence, creating dashboards, and other achievements from the fourth industrial revolution. Unfortunately, existing researches do not give enough attention to combining internal control system with the listed tools. Although the concept of «Accounting 4.0» has been invented long ago, the enterprise internal control system does not always use digitalization achievements. In B. Aslanertik and B. Yardımci [2] explanation of the «Accounting 4.0» paradigm, accounting became the basis for combining strategic and operational aspects of value creation for the primary consumers.

An example here is A. Kanak with his co-authors' proposal [3], where they offered usage of digital twin concept for creating the blockchain architecture for modelling and controlling the enterprise operations. It is evident, accounting does not necessarily have to be based on the blockchain technology, as suggested in the [3] research. However, the enterprise internal control system must be oriented on the connection between strategic management stockholders' information requests and management accounting capabilities. Thus, the enterprise internal control system has to be transformed into an integrated system of control (integrated controlling system). The proof of this statement also connected to the research of B. Aslanertik and B. Yardımci [2], where the question have been raised about the possibility to use the total amount of available data for decision making.

Integrated system of control cannot be considered separately from its accounting and analytical support. Usually the researches in management accounting have covered this very important task. As an example here the researches of P. Atrill [4], K. Braun [5], K. Corsi [6], E. McLaney [4], W. Tietz [5] could be given. However, during the management accounting organization, it is also necessary to be aware of the differences in the decision-makers' information requests. The research in the field of accounting information systems creating and financial accounting information using, conducted by M. Bettner [7], R. Hilton [8], D. Platt [8], B. Romney [9], P. Steinbart [9], may be useful. Unfortunately, the only weak link between these two sets of researches could be established. That is why researching of the areas of creating decision-making system have to be continued. Moreover, the J. Broadbent and R. Laughlin [13] proposals about the existence of some differences between the concepts of «accounting control» (about the use of systems of accounting) and «controlling accounting» (to ensure that accounting practices fits to enterprises' concerns) have to be taken into consideration.

In the case of accounting, many researchers, such as S. Bragg [10] and D. Chorafas [11], refer to forming the internal control environment. This environment also could be presented as a part of the decision-making system. In the article's author opinion, the process of forming the internal control environment must be expended on connection with strategic enterprise management. The proof of this proposal could be based on C. Chapman's [12] study, which provides developments in the management accounting by expanding the accounting process on the enterprise strategic initiatives. The same expanding must be done towards internal control system. Moreover, in case of forecasting and prediction the decision-making, forming the internal control system could be based on new accounting technics like lean accounting described by J. Stenzel [14] or throughput accounting based on the usage of the Theory of Constrain and represented by J. Caspari [15]. This suggestion will determine the purpose of the research.

Setting objectives. The purpose of this article is to create an enterprise's integrated accounting and the controlling system as a combination of management account-

ing, internal audit, and predictive analytics subsystems. The author's hypothesis is that a combination of such subsystems will provide the most complete satisfaction of the interests of stockholders in information support for solving their problems.

Presentation of the main research material. Achieving the article goal implies that only the integrated accounting and controlling system (IACS) is capable of solving problems related to the development of scientifically substantiated relevant to changing current requirements from customers and the environment. Forming IACS is necessary for receiving the relevant management recommendations for the adoption of optimal managerial decisions concerning the development of business entities not only at present, but also for the long-term perspective. IACS helps the enterprise to achieve its strategic and operational goals, using a systematic and consistent approach to assessing and improving the effectiveness of information gathering, risk management processes, profit prediction, and corporate governance. The main task of IACS is an independent objective assessment of economic, organizational and information characteristics of the company in order to express an opinion on their relevance and adequacy, developing recommendations for their improvement, and improving the efficiency of management. For achieving these tasks, IACS has to be integrated with the enterprise management system. This integration is possible only in the case of establishing a connection with all types of enterprise management. The main areas of contact between IACS and enterprise management are shown in Figure 1. In addition, Figure 1 presents the inner structure of the IACS. The presence of the corporate governance system as a part of the Fig. 1 gives us the possibility to consider the integrated reporting concept as a part of IACS. The IACS should be oriented on the priority use of information about the external sphere of activity of the enterprise, since in today's changing economic conditions, traditional systems of collection and processing of accounting information are not adapted for tracking and forecasting crisis business tendencies, they are mostly focused on stable external conditions of activity.

IACS in the author's understanding is a conglomerate of instruments of financial and managerial accounting, which has a strategic orientation, which allows integration of accounting information with the data on the external environment and information predictive nature. Only under such conditions, IACS can be fully implemented in the process of corporate governance and strategic management. This is exactly what is shown in Fig. 1. The information generated by the system of IASC will serve as an information basis for the formation and implementation of a business strategy. The main difference of IACS is the widespread use of tools for analysis and management of the environment with strategic accounting. One of the shortcomings of the accounting system is the excessive concentration on the factors of the internal environment of the enterprise and the lack or non-systematic conduct of the analysis of external factors. These disadvantages could overcome the IACS presenting as an element of the strategic management system. IACS should ensure the adaptation of managers to changes occurring in the enterprise environment, provide identification of critical situations, main opportunities and threats, and generally act as an instrument for maintaining economic security and ensur-

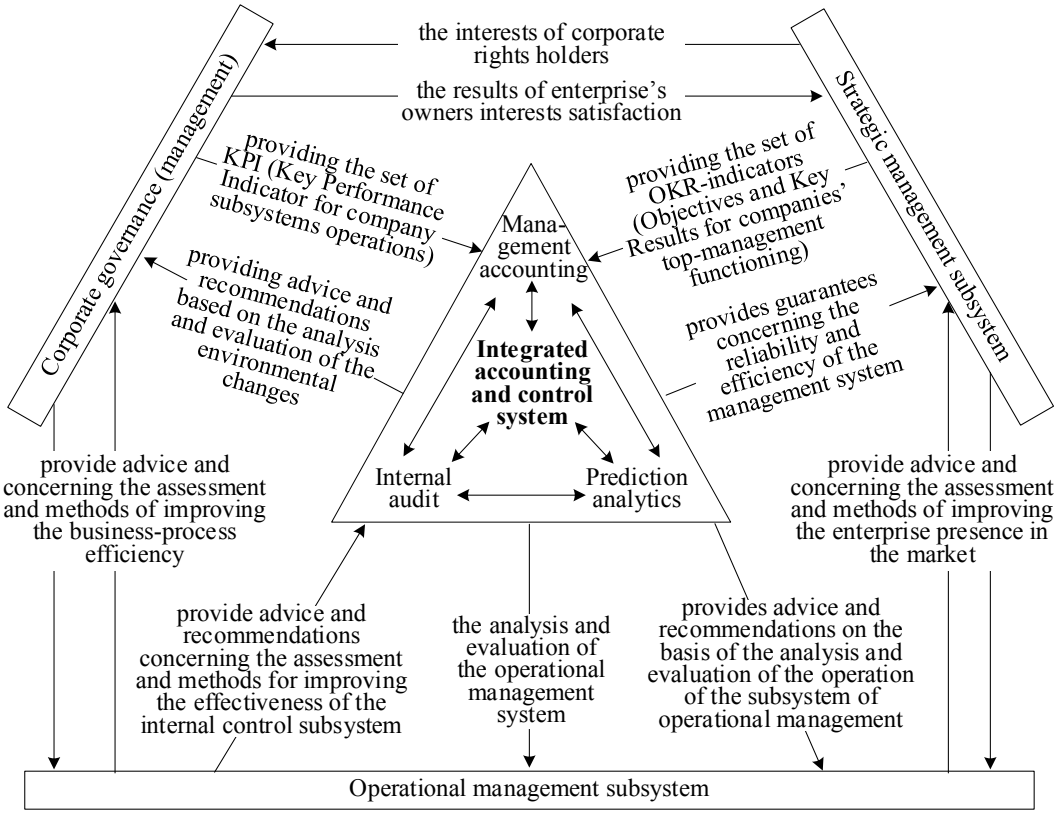

Figure 1. The interconnection between an integrated accounting and the controlling system (IACS) and different levels of enterprise management hierarchy

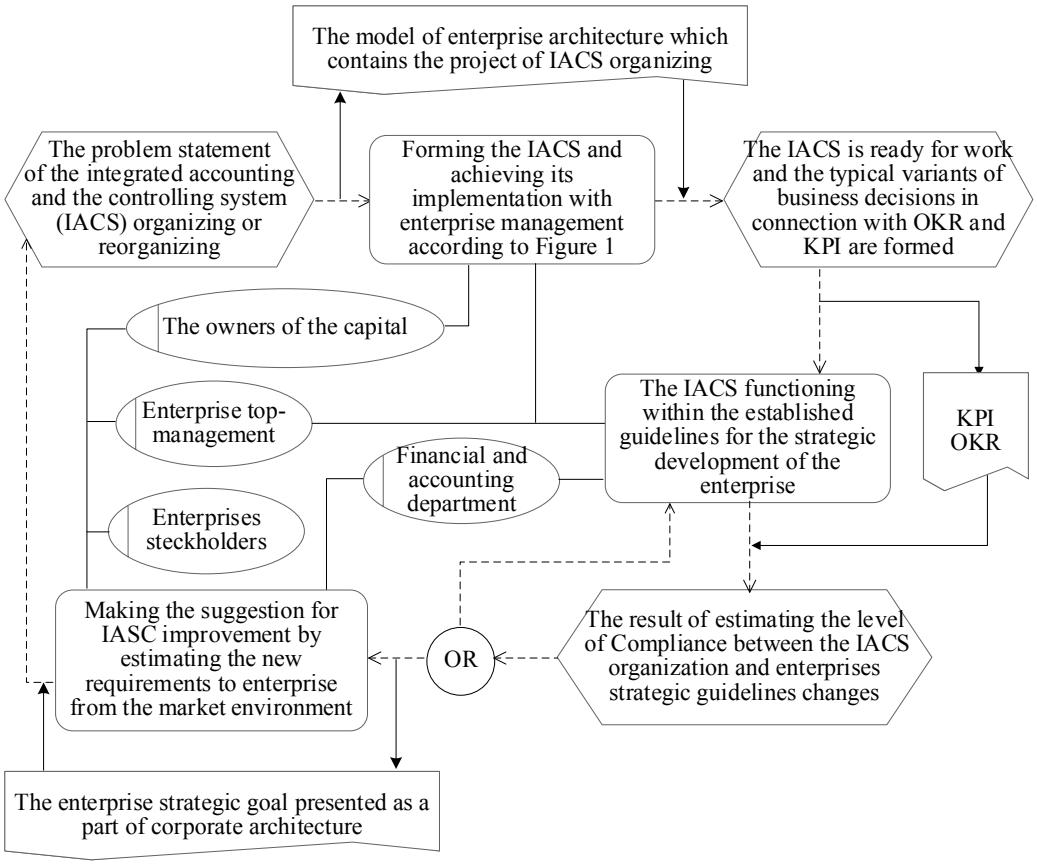

Figure 2. The description of the integrated accounting and the controlling system implementation, presented in EPC-notation

ing sustainable development of the enterprise in a dynamic market environment. In order to determine and implement the strategy of the organization's management, there must be an in-depth understanding of the external environment, trends in its development and the place occupied by the organization.

IACS could help to solve one of the biggest current problems of inconsistencies between inquiries of internal and external users of the accounting metrics. In addition to retrospective accounting information, users also need predictive and probabilistic information that would reveal the tendencies of the operation of the company and form a vision of depositors of capital regarding the prospects of investment, the provision of borrowed funds, etc. The investor as an external user of financial reporting is more concerned with the question of the efficiency of operations and financial stability in the future period in which his investments will work, and not what it was before the investments. Moreover, the current accounting can only give a picture of the past and in no way the future. Consequently, the demand for predictive accounting information could be fulfilled by implementing IACS. The use of predictive (probabilistic) information in IACS involves not only the formation of forecast financial statements for internal and external users (shareholders, investors, rating agencies, etc.) obtained with techniques similar to the evaluation of investment projects. Forecast information should also be formed by using non-conservative accounting methods that are based on the probability indicators. That is, the starting point for forecasting the accounting indicators should not be the corresponding indicator of the previous period. In this case implementing IACS must be based on transformation of the accounting techniques, which are used for forming the key performance indicator. The author's view of this kind of improvement while IACS implementing is shown in Figure 2.

Presented in Figure 2 organizational sequences of the project of IACS developing is based on the Event-Driven Process Chain (EPC) Diagram. Because this diagram was made for modeling the business process improvement, it gives the possibility to represent the interconnection among the enterprise department during the IACS implementing and improvement in Figure 2. The advantage of the article proposal is the involvement of the enterprise architecture concept for discovering the structure of integrated accounting and the controlling system.

Conclusions from the conducted research. Thus, IACS is considered as an informational and decision-making support of enterprises' management. The IACS allows to identify the factors for enterprise success creation and could provide information about them for making managerial decisions. In this case, the system of strategic accounting is considered as one of the security subsystems of the system of IACS. The generalization of the reasons for the necessity of constructing IACS allows us to establish that as the preconditions for its emergence acted as external factors (general economic) and internal (direct accounting). From the moment of its occurrence, accounting performs a service function, providing the needs of enterprise stockholders' for information to make appropriate manage-

rial decisions. Depending on the changes in user inquiries, the emergence of new requirements for accounting information is gradually transforming the accounting theory and methodology. In view of this, IACS should be built based on use of methodological tools that will identify and parameterize the objects of the environment and handle and present information about them to users for strategic management decisions.

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