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ENGINEERING OF BUSINESS PROCESSES IN ACCOUNTING SUPPORT OF CASH MANAGEMENT

Purpose. *The purpose of the study is to develop the accounting aspect of business process engineering as the main tool in management.*

Methodology / approach. *The research uses methods of scientific abstraction, grouping and systematization to identify the current state and outline the directions of development of accounting engineering. Methods of analysis and synthesis, as well as the coefficient method for the development of the analytical component of cash management are used.*

Results. *Engineering is an effective tool for optimizing business processes of enterprises. It should be considered as a way of implementation into a certain sphere of human activity non-specific (foreign) tools, techniques, methods, etc., aimed at solving problems that cannot be solved by the existing tools specific to this area of activity. Accounting engineering is the process of developing, designing and implementing innovative tools, methods and techniques borrowed from other sciences that are used to improve accounting as a system that provides information to the management system. It is a platform for generating the accounting information needed to make strategic management decisions. The effect of accounting engineering is analyzed on the example of cash management, as current trends are focusing more and more on cash flow as the main object of financial management of the enterprise. A cash management mechanism based on accounting engineering is proposed, which includes the following stages: cash flow planning and forecasting, adherence to the schedule of receipts and payments within budget limits, evaluation of cash management efficiency.*

Originality / scientific novelty. *It is proved that the need for engineering for accounting science and practice is necessitated by the need to form special ways to solve problems that have remained unresolved for accounting for a long time and could not be solved due to limited methodological approaches, methods and techniques. The influence of accounting engineering on the efficiency of the management system on the example of cash management is outlined.*

Practical value / implications. *The application of business process engineering in cash flow management of the enterprise by assessing the value of the integrated indicator of cash flow management has identified a number of cash flow management problems, their causes, consequences (risks) for the company and provide suggestions to minimize identified risks.*

Key words: *agricultural finance, accounting methodology, accounting engineering, strategic accounting, management accounting, cash flow efficiency.*

Introduction and review of literature. *The efficiency of business development is an urgent issue for Ukrainian enterprises, in particular agricultural enterprises. The issue of efficiency can be solved through the improvement of the management*

system, in particular its information support based on the use of innovative methods. The application of engineering in the field of accounting is among the new and most controversial issues today.

Engineering is a set of techniques and methods that a company uses to forecast its own development in order to increase business efficiency. It is aimed at developing the optimal solution in the given parameters of the business entity and in accordance with its strategic goals. Engineering is one of the promising and constructive methods of process management.

Herath (1996) researched the role of accounting management in the processes of engineering business processes of the enterprise, which was his initial stage of a deeper acquaintance with this issue. Next, together with Gupta and Messerschmidt, Herath (2006) studied organizational change management techniques and the leading role of the accountant in management in order to achieve organizational goals and objectives through active participation in business processes of engineering. Some aspects of business process management of agricultural enterprises using engineering tools were applied by Ostapenko et al. (2020), Pronko et al. (2020).

The origin and development of engineering in Ukraine was studied by Zhuk (2013). The author believes that “accounting engineering should be considered as a universal tool for accounting modeling, based on the use of traditional accounting data and providing their transformation and addition to meet the needs of users of information from the new engineering accounting system” (Zhuk, 2013).

According to the research of Marshall and Bensal (1998), Tkach (2013), the concept of financial and accounting engineering includes the following procedures: 1) objects and management processes; 2) theoretical and methodological foundations of engineering; 3) engineering mechanisms and tools; 4) accounting technology; 5) accounting and analytical support: aggregated mega-accounts, aggregated accounting entries, monitoring derivative balance sheets; 6) results of use.

In the world practice of accounting, analysis and auditing, the following engineering methodologies were developed: zero balance sheet reports (Aksenova, 2011), engineering theory of accounting (Tkach, 2013; Tkach and Shumeiko, 2013), aggregated accounting entries (Stone, 1962; Gerasimovych 2017), situational accounting (Kolvakh, 2000; Sorter, nd). Accounting engineering is based on management and strategic accounting (Shumeiko, 2012), which allows for accounting forecasting of the enterprise.

In his scientific work, Pylypchuk (2020) pointed to the gap in the study of the impact of cognitive information technology on management accounting and the profession of management accountant in terms of a reasonable and sustainable concept of organization. An analysis of the application of new technologies in financial services around the world for the period 1975–2019 was performed by Abad-Segura et al. (2020).

Skorev et al. (2020) proved that “the use of various methods and tools of strategic accounting, including accounting engineering tools, will help to establish all business processes and get the most out of financial and operational activities”.

With regard to accounting management in business processes, we should note the implementation of innovative tools to improve the quality of service, which were studied in the works of Bazaluk and Yatsenko et al. (2020), Andriushchenko et al. (2020) and others.

The purpose of the article is to develop the accounting aspect of business process engineering as the main tool in management. The following tasks were identified and solved to achieve this goal: to reveal the essence of accounting engineering, to develop a system of indicators to assess the effectiveness of accounting engineering, to improve cash flow management in the application of accounting engineering.

Results and discussion. *Accounting engineering in business process management.* Ukrainian enterprises have an unsatisfactory financial condition, although there is a tendency to improve it (Fig. 1). This financial situation is typical for agricultural enterprises, as evidenced by the results of studies by scientists Kirieieva et al. (2019), Kravchenko et al. (2020), Zamula et al. (2020). Therefore, the use of modern management tools that would allow building forecasts for the development of activities for Ukrainian enterprises, in particular in terms of improving the efficiency of their activities, is a priority of research.

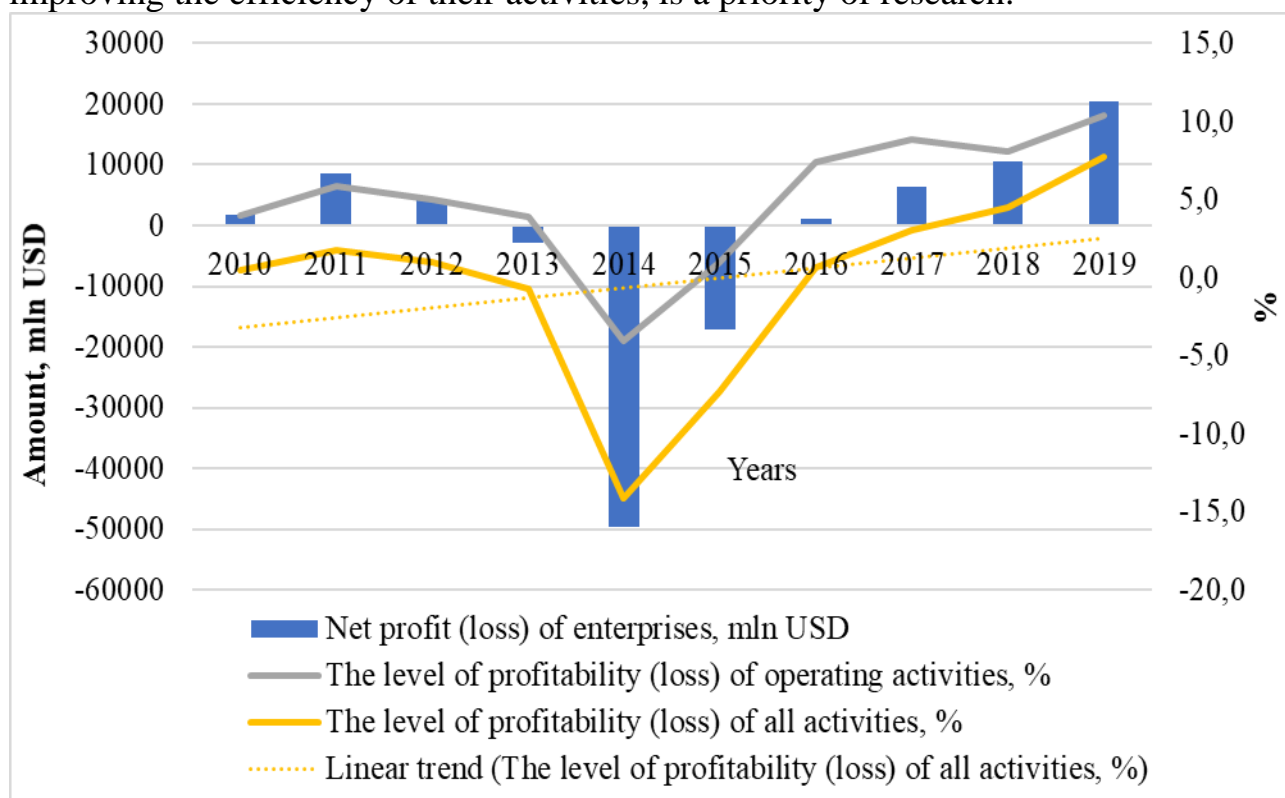


Fig. 1. Dynamics of net profit and profitability of Ukrainian enterprises

Source: development by authors based on (Official site of the State Statistics Service of Ukraine, 2020).

The object of engineering is the business processes that determine the activities of the enterprise. The business process is a holistic description of the main activities of the company and their projection on the organizational structures of the economic

object, taking into account the interaction between them (Osaulenko et al., 2020; Skorev et al., 2020). A characteristic feature of business processes is their continuity, the presence of inputs (resources, ideas, information) and outputs (Bilan et al., 2017; Yatsenko et al., 2019). The output of properly constructed business processes increases the value of the product (services, information) for the customer and the efficiency of activities (Terepyshchyi and Khomenko, 2019).

Business process engineering is a set of methods, tools and technologies aimed at radical restructuring of business processes that are designed to solve business management problems in order to achieve business efficiency.

The nature, purpose and potential of engineering and its application in the interdisciplinary space of the sciences related to accounting testifies to the need and possibility of using engineering tools in improving the scientific provisions of accounting.

Accounting engineering involves a creative approach to improving accounting, i.e. the application of such measures and methods, according to which the company has the necessary information to make sound management decisions. Prerequisites for the development of accounting engineering are the emergence of information requests for a number of objects that were not previously reflected in the account, namely risks, intellectual capital, sustainable development, etc.

Accounting engineering is the process of developing, designing and implementing innovative tools, methods and techniques borrowed from other sciences that are used to improve accounting as a system that provides information to the management system. Accounting engineering contributes to the achievement of strategic goals of the enterprise. There is a certain integration of accounting with business process engineering, which creates information support for current and strategic management (Fig. 2).

With the implementation of business process engineering, the accounting methodology will change, becoming more flexible and unified. Accounting will expand its accounting and analytical functions in the business management system, by synthesizing it with the processes of planning and budgeting. Thus, budgeting is not only the procedure of the formation of budgets, but also control over their execution on the basis of the accounting and the analysis of business processes.

Accounting engineering is a platform for generating the accounting information which is necessary to make strategic management decisions.

Cash flow management in the application of accounting engineering. Accounting and analytical support of business processes of cash flow management is carried out with the help of accounting engineering tools, which are included in a comprehensive management system of the enterprise.

The effect of accounting engineering can be traced to the example of cash management, as current trends are focusing more and more on cash flow as the main object of financial management of the enterprise. The company's cash is characterized by uneven income and expenditure in terms of individual periods, which leads to temporarily free flows, which are inefficient assets. The main purpose

of cash management is to ensure a sufficient level of their receipt and efficient use, as well as the formation of positive and negative cash flow to maintain financial balance and dynamic solvency.

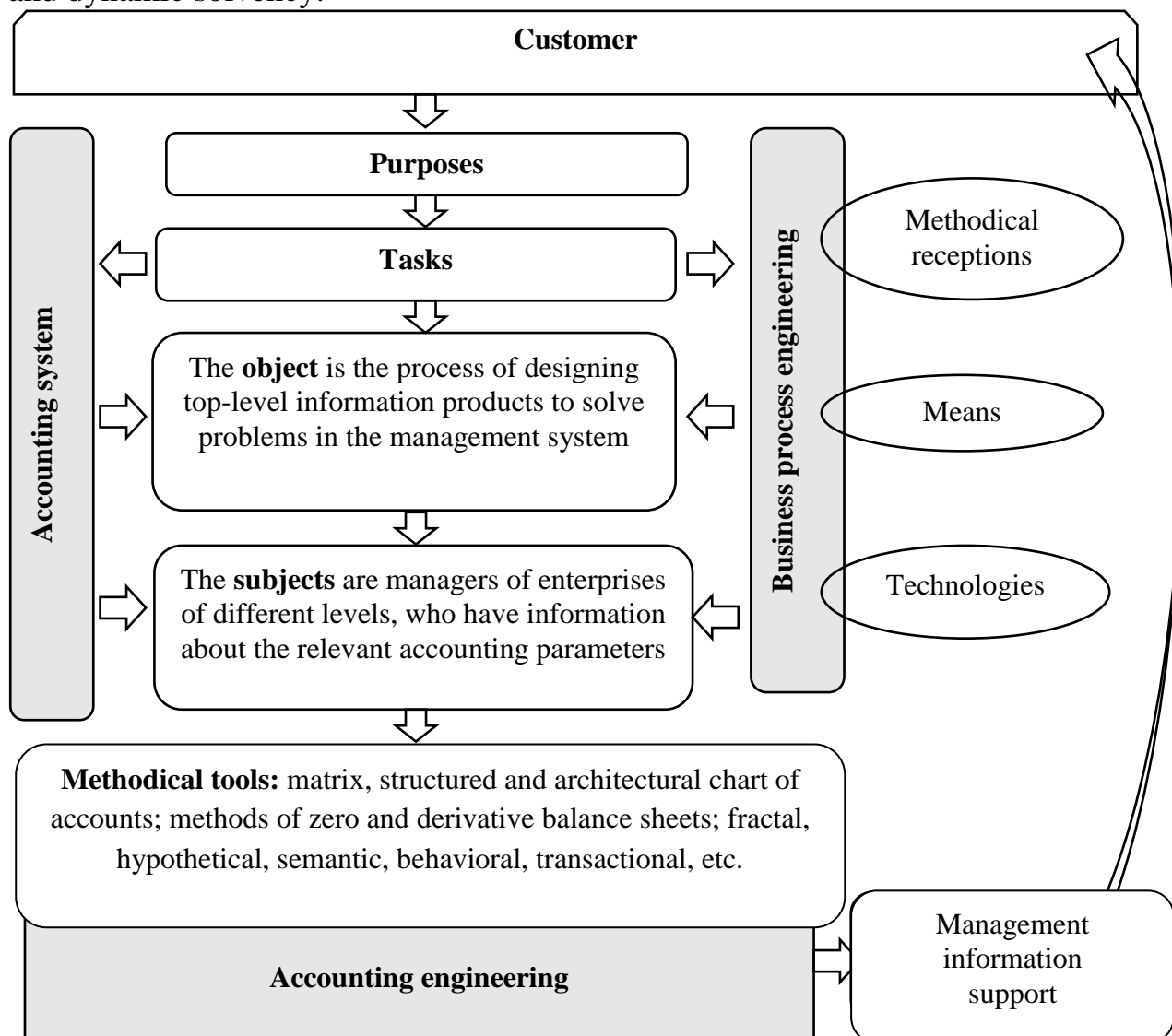


Fig. 2. The essence of accounting engineering based on a structural approach

Source: developed by the authors.

The main components of accounting engineering in providing cash flow management are: 1) development and identification of business processes of cash flow management as “objects of accounting”; 2) working plan of cash accounts for double entry; 3) accounting engineering tools; 4) accounting registers: “Management reports of cash management” “Derivative balance sheets”; 5) the result of accounting – determining the effectiveness of the implementation of accounting engineering in cash management. The system of accounting and analytical maintenance is formed on the basis of the specified engineering tools of accounting.

To perform cash management tasks successfully, it is necessary to carry out systematic planning of all cash flows, clearly organize the work of units, as well as to establish a system of control over cash flows and make operational decisions to address identified problems. A system of accounting engineering is required to

perform these tasks.

Empirical studies of business processes of receipt and expenditure of funds have identified the following problematic issues:

- the lack of clear division in the management of their movement in terms of operating financial and investment activities;
- low level of application of automated processes of accounting, planning and control in the management;
- lack of flexibility in planning and budgeting;
- lack of schedules of receipt and repayment of debt;
- non-compliance with the proportions of the distribution to service operating activities and investments in financial investments;
- untimely reflection in the accounting of cash flow transactions.

To eliminate the identified problems, a cash management mechanism is proposed, which is built using accounting engineering, which includes the following stages:

1. Cash flow planning and forecasting.
2. Adherence to the schedule of receipts and payments within the budget limits.
3. Evaluation of the effectiveness of cash management.

Cash flow planning and forecasting. Cash flow planning is a prerequisite for ensuring the fulfillment of its financial obligations and the efficient use of own and borrowed funds.

Balancing of cash flows takes place in the general budget of the enterprise, which is a system of interdependent budgets for sales, costs and other planned events of subsequent periods.

The Planned Balance of Cash Receipts and Expenditures reflects the planned receipts and disbursements of money in future reporting periods. This report is part of the budget of the enterprise and therefore it is closely interrelated with the budget of expenses and income of the enterprise. The purpose of such a document is to ensure the rhythm of cash inflows and outflows in subsequent periods, which can be achieved by having the necessary information on cash flows and its operational analysis. It is necessary to determine the frequency of its making and take into account that the more remote the planning period is, the lower the probability of forecasting accuracy.

It is important to form such a document on the basis of the “cash” principle, which means to focus on the actual receipt of funds, rather than on the right to receive them. It is expedient to do it on the basis of the analysis of the concluded contracts for the future periods that will allow forecasting with a high probability the sum of money receipts. It is also necessary to take into account the trends formed in previous years for the sale of products: the percentage of cash payments and advances received, overdue and bad debts.

Scheduled disbursements are more predictable than receipts, because managers plan in advance the volume of activities, and hence costs. This requires information on payments to be repaid in the period in which they are accrued and on which

liabilities can be settled in subsequent reporting periods. To do this, a payment schedule must be developed at the company. This will make it possible to determine the exact date of the obligations to repay them.

Adherence to the schedule of receipts and payments within the budget limits. For daily operational management and control of cash flows, the Payment Calendar is important, which is the balance for a specific calendar date. Payment calendar is a short-term plan (forecast) that covers the cash flow of the enterprise on the current date and allows linking the receipt and disposal of funds for the day, 10-day period, and month, both in cash and non-cash forms.

This document allows synchronization of the receipt and expenditure of funds per day, 10-day period, month in the operational mode, as well as ensures compliance with the priorities of payments, and allows managing solvency. The use of a cash flow management system based on accounting engineering and the tool “Payment Calendar” can improve the financial condition of the enterprise, optimize the movement of cash flows and increase the efficiency of the processes of formation, distribution and use of cash.

We consider it expedient to assess the effectiveness of cash flow management in the following stages:

- 1) analysis of balance and synchronicity of cash flows;
- 2) analysis of liquidity and cash flow efficiency.

Analysis of the balance and synchronicity of cash flows allows assessing the degree of dynamic solvency of the enterprise, its financial stability and the ability to ensure sustainable economic growth.

The analysis of the balance of revenues and expenditures by periods should be carried out on the basis of determining the efficiency of use of funds. Thus, the use of cash is effective if there is a positive net cash flow from operating or financial activities, or investment. Signs of inefficient use of funds are: the presence of negative cash flow from operating activities, the presence of positive cash flow from all activities simultaneously.

Cash flow balancing can be done using the following tools:

1) when the negative cash flow exceeds the positive one: raising additional equity or long-term debt capital; increasing the turnover of current assets; liquidation of non-core non-current assets; reduction of investment projects of the enterprise; cost reduction;

2) when the positive cash flow exceeds the negative: increase the investment activity of the enterprise; diversification of activities; early repayment of long-term loans.

Considerable attention in cash flow management should be paid to the synchronicity of cash flows, which can be assessed by the coefficient of synchronicity of cash flows (K_{synch}):

$$K_{synch} = \frac{\sqrt{\sum_{i=1}^n (PCF_i - NCF_i)^2}}{n}$$

where PCF_i – positive cash flow in the i -th period, thousand UAH;
 NCF_i – negative cash flow in the i -th period, thousand UAH;
 n – the number of periods studied.

The closer to zero the value of the cash flow synchronicity ratio is, the more synchronous the cash flows are.

We propose to analyze the liquidity and efficiency of cash flows according to the following indicators: cash flow liquidity ratio (C_l), cash flow efficiency ratio (C_e), cash flow to net cash flow ratio (C_r), receivables collection ratio (C_c), accounts payable (C_p), net cash flow adequacy ratio (C_a), profitability of cash balance (P_b), return on cash (P_r), financial cycle (Prodanchuk, 2019; Pilipczuk, 2020).

On the basis of the given indicators the integrated indicator of efficiency of management of cash flows (I_e) which characterizes the general efficiency of management of cash flows for the analyzed period is constructed:

$$I_e = C_l + \Delta C_e - \Delta C_r + \Delta C_c + \Delta C_p + \Delta C_a + \Delta P_b + \Delta P_r$$

Positive dynamics of the given indicator tends to grow. This indicator takes into account a number of factors that affect cash flows, so predicting future cash flows, the company can get the desired amounts of positive and negative cash flow, regulating one or more of the factors, without compromising the overall efficiency of cash flow management.

Together with the integrated indicator of efficiency of management of cash flows it is necessary to estimate a financial cycle of the enterprise. The faster one financial cycle is, the more efficiently the company manages cash flows.

Approbation of the integrated indicator was carried out on the example of PJSC “Oril-leader” (type of economic activity – poultry breeding) (Table 1).

Table 1

Indicators of cash flow management efficiency in PJSC “Oril-leader”

Indicators	Years									
	according to reports							forecast		
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Integrated cash flow management performance indicator	-80948	-4739	11942	2662	-358	-8553	6396	7570	12720	15890
Financial cycle, days	433	266	173	151	181	161	170	140	125	110

Source: calculated by the authors.

The dynamics of the integrated indicators of cash flow and financial cycle calculated according to the reporting of the enterprise and projected (based on bringing the factors of influence to a level that allows the enterprise to have higher efficiency of cash flow management) is shown in Fig. 3 and 4.

Thus, the integrated indicator of cash flow management and financial cycle shows the same tendency to improve cash flow management of the enterprise, due to a number of exogenous and endogenous factors (Marshall and Bansal, 1998).

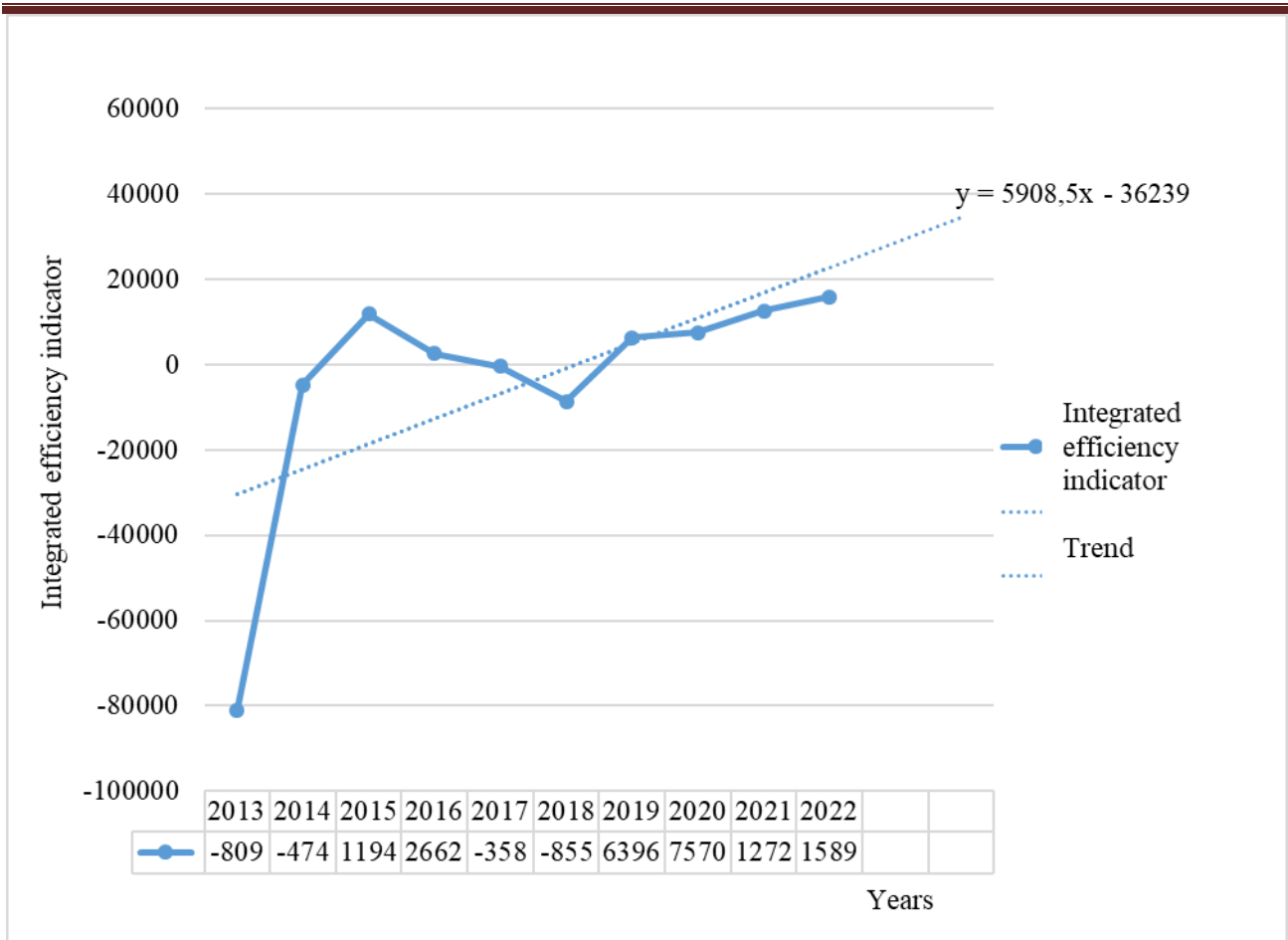


Fig. 3. Dynamics of the integrated indicator of cash flow management efficiency of PJSC “Oril-Leader” and its forecast

Source: developed by the authors.

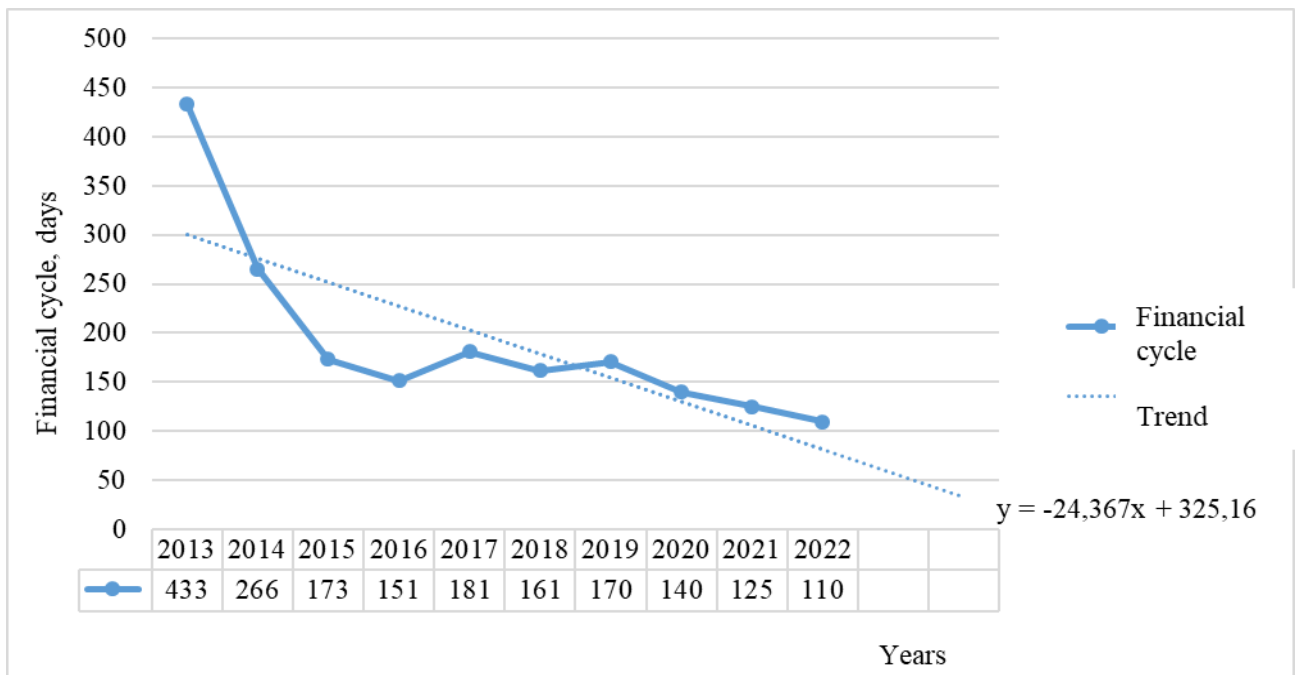


Fig. 4. Dynamics of the financial cycle of PJSC “Oril-Leader” and its forecast

Source: developed by the authors.

It is possible to improve the efficiency of cash management to achieve the strategic goals of the enterprise through the influence of factors that form an integrated indicator of cash flow management, which allows predicting the efficiency of cash flow management may increase in three years (2020–2022).

A system of indicators has been developed to assess the effectiveness of accounting engineering, which allows determining how close the business is to the desired model of operation (Table 2).

Table 2

Evaluation of the effectiveness of accounting engineering business processes of cash management

Indicators	Characteristic
1. Quantitative	
1.1. The duration of the business process	Reducing the duration of the stages of the business process of cash management
1.2. The level of costs for the business process	Reducing the level of costs by stages of the business process of cash management
1.3. Number of errors	Minimize errors when developing and building cash management business processes
1.4. Efficiency of labor resources used	Increasing the efficiency of labor resources, ensuring maximum employment of participants in the business process of cash management
1.5. Financial cycle	Reducing the duration of the financial cycle of the enterprise
1.6. Growth of the financial result of the enterprise	Increase in net profit, profitability of the enterprise after the introduction of business process engineering
2. Qualitative	
2.1. Communication	Improving the horizontal and vertical connections of the cash management system
2.2. Satisfaction of suppliers and buyers	Increasing the level of satisfaction of suppliers and customers with cooperation with the company, reducing the number of claims and lawsuits
2.3. Maintaining market position	Adequacy of enterprise development strategy, tactics and cash management mechanisms
2.4. Staff motivation	Increasing the level of satisfaction among workers
2.5. Workplace organization	Improving the organization of cash management business processes
2.6. Ensuring the effectiveness of all management subsystems	Reduction of hierarchical levels of management, the transition from individual decision-making in cash management to teamwork

Source: developed by the authors.

The above system of indicators for assessing the effectiveness of accounting engineering makes it possible to determine how close the business is to the desired model of operation.

The approach proposed in the article to the management of cash flows of the enterprise through the use of business process engineering as the main tool in management is the result of research in the field of business process engineering and

cash flow analysis (Prodanchuk, 2019; Zamula, 2016; Zamula et al., 2020; Kovalchuk and Verhun, 2018).

The application of business process engineering in cash flow management by assessing the value of an integrated indicator of cash flow management has identified a number of cash flow management problems, their causes, consequences (risks) for the company and proposals to minimize the identified risks (Table 3).

Table 3

Proposals for cash flow management of the enterprise

Problems identified	Causes	Consequences / Risks	Suggestions
1) the lack of division of cash flows in terms of activities; 2) low level of application in the management of automated processes of accounting, planning and control; 3) non-compliance with the flexibility of planning and budgeting; 4) lack of schedules of receipt and repayment of debt; 5) non-compliance with the proportions of the distribution to service operating activities and investments in financial investments; 6) untimely reflection in the accounting of cash flows.	1) lack or formal use of management tools; 2) unsatisfactory management of accounts payable; 3) the lack of accounting data at the time of planning cash expenditures.	1) lack of effective cash flow planning for operational, tactical and strategic management; 2) the process of making payments is complicated due to the lack of application of accounting engineering.	Development and implementation of effective cash management based on accounting engineering at the following stages: 1. Cash flow planning and forecasting. 2. Adherence to the schedule of receipts and payments within the budget limits. 3. Evaluation of the effectiveness of cash management.

Source: developed by the authors.

Thus, the implementation of effective cash management based on accounting engineering at the proposed stages will contribute to the achievement of strategic goals of the enterprise and its financial stability.

Conclusions. The need for engineering for accounting science and practice is due to the necessity of developing special ways to solve problems that have remained unresolved for a long time and could not be solved due to limited methodological approaches, methods, techniques, etc. The nature, purpose, potential of engineering and its application in the interdisciplinary space of accounting-related sciences indicate the need and possibility of using engineering tools to improve the scientific provisions of accounting. The influence of accounting engineering on the efficiency of the management system on the example of cash management is outlined. The product of accounting engineering is the information flows necessary for making strategic management decisions in the agricultural sector. To form such information flows, accounting must expand its accounting and analytical functions in the business management system, by synthesis with the processes of planning and budgeting.

The application of business process engineering in cash flow management by assessing the value of an integrated indicator of cash flow management allowed

identifying a number of cash flow management problems, their causes, consequences (risks) for the company and to provide suggestions to minimize the identified risks. Further research is needed to develop an accounting methodology taking into account the information requests of strategic management.

References

1. Abad-Segura, E., González-Zamar, M.-D., López-Meneses, E. and Vázquez-Cano, E. (2020), Financial technology: review of trends, approaches and management. *Mathematics*, vol. 8(6), 951. <https://doi.org/10.3390/math8060951>.
2. Aksenova, E. A. (2011), Accounting engineering in resource management and enterprise economics. *Russian entrepreneurship*, vol. 2/2(178), pp. 107–112.
3. Andriushchenko, K., Buriachenko, A., Rozhko, O., Lavruk, O., Skok, P., Hlushchenko, Y., Muzychka, Y., Slavina, N., Buchynska, O. and Kondarevych, V. (2020), Peculiarities of sustainable development of enterprises in the context of digital transformation. *Entrepreneurship and sustainability issues*, vol. 7(3), pp. 2255–2270. [http://doi.org/10.9770/jesi.2020.7.3\(53\)](http://doi.org/10.9770/jesi.2020.7.3(53)).
4. Bazaluk, O., Yatsenko, O., Zakharchuk, O., Ovcharenko, A., Khrystenko, O. and Nitsenko, V. (2020), Dynamic development of the global organic food market and opportunities for Ukraine. *Sustainability*, vol. 12(17), 6963. <https://doi.org/10.3390/su12176963>.
5. Bilan, Yu. V., Nitsenko, V. S. and Samoilyk, Iu. V. (2017), Conceptual modeling of agri-food market development under economy's globalization. *Scientific bulletin of Polissia*, no. 3(11), p. 1, pp. 54–61. [https://doi.org/10.25140/2410-9576-2017-1-3\(11\)-54-61](https://doi.org/10.25140/2410-9576-2017-1-3(11)-54-61).
6. Sorter, G. Economic dictionary (n. d.), available at: http://mirslouvrei.com/content_eco/SORTER-DZHORDZH-6361.html.
7. Gerasimovych, I. A. (2017), Accounting and analytical support of financial risk management and reserves of the enterprise. *Finance, accounting and auditing*, vol. 2 (30), pp. 202–214.
8. Gupta, A., Messerschmidt, D. C. and Herath, S. K. (2006), Business process reengineering and the management accountant. *International Journal of Management and Enterprise Development*, vol. 3, no. 1/2, pp. 98–113. <https://doi.org/10.1504/IJMED.2006.008245>.
9. Herath, S. K. (1996), The role of the management accountant in business process reengineering, available at: <https://ro.uow.edu.au/theses/2280>.
10. Kirieieva, E. A., Pryshliak, N. V., Shamanska, O. I., Salkova, I. Yu. and Kucher, A. V. (2019), Strategic priorities and financial support of Ukrainian agricultural sector development. *International Journal of Ecological Economics & Statistics*, vol. 40, no. 2, pp. 25–37.
11. Kolvakh, O. I. (2000), Situational-matrix accounting as one of the means of developing the theory of accounting in the conditions of modern software and information technologies. *Audit and financial analysis*, vol. 3, available at: http://www.cfin.ru/press/afa/2000-3/15_kol.shtml.
12. Kovalchuk, T. M. and Verhun, A. I. (2018), Analysis of the financial

condition of enterprises by phases of their life cycle. *Scientific bulletin of Polissia*, vol. 2(14), part 2, pp. 31–38. [http://doi.org/10.25140/2410-9576-2018-2-2\(14\)-31-38](http://doi.org/10.25140/2410-9576-2018-2-2(14)-31-38).

13. Kravchenko, O., Kucher, A., Heldak, M., Kucher, L. and Wysmulek, J. (2020), Socio-economic transformations in Ukraine towards the sustainable development of agriculture. *Sustainability*, vol. 12(13), 5441. <https://doi.org/10.3390/su12135441>.

14. Marshall, J. F. and Bansal, V. K. (1998), *Financial engineering: a complete guide to financial innovation*. New York Inst of Finance, New York, USA.

15. Official site of the State Statistics Service of Ukraine (2020), available at: <http://www.ukrstat.gov.ua>.

16. Osaulenko, O., Yatsenko, O., Reznikova, N., Rusak, D. and Nitsenko, V. (2020), The productive capacity of countries through the prism of sustainable development goals: Challenges to international economic security and to competitiveness. *Financial and credit activity: problems of theory and practice*, vol. 2, no. 33, pp. 492–499. <https://doi.org/10.18371/fcaptp.v2i33.207214>.

17. Ostapenko, R., Herasymenko, Y., Nitsenko, V., Koliadenko, S., Balezentis, T. and Streimikiene, D. (2020), Analysis of production and sales of organic products in Ukrainian agricultural enterprises. *Sustainability*, vol. 12(8), 3416. <https://doi.org/10.3390/su12083416>.

18. Pilipczuk, O. (2020), Toward cognitive management accounting. *Sustainability*, vol. 12(12), 5108. <https://doi.org/10.3390/su12125108>.

19. Prodanchuk, M. (2019), Planning and forecasting in cash flow management. *Effective business management*, available at: <https://5sfer.com/planirovaniye-i-prognozirovaniye-v-upravlenii-denezhnymi-potokami-tsikl-publikatsiy-effektivnoye-upravleniye-biznesom-stat-ya-2>.

20. Pronko, L., Furman, I., Kucher, A. and Gontaruk, Y. (2020), Formation of a state support program for agricultural producers in Ukraine considering world experience. *European Journal of Sustainable Development*, vol. 9, no. 1, pp. 364–379. <https://doi.org/10.14207/ejsd.2020.v9n1p364>.

21. Shumeiko, M. V. (2012), The concept of accounting engineering tools. *Terra Economicus*, vol. 10, no. 1.2, pp. 72–77.

22. Skorev, M. M., Grafova, T. O., Kirishchieva, I. R. and Mishchenko, O. A. (2020), The use of accounting engineering elements in strategic accounting. *Proceedings of the International Conference on Economics, Management and Technologies (ICEMT 2020)*. Atlantis Press, France. <https://doi.org/10.2991/aebmr.k.200509.068>.

23. Stone, R. (1962), Multiple Classifications in Social Accounting. *Bulletin of the International Statistical Institute*, vol. 3, pp. 215–233.

24. Tkach, V. I. (2013), Engineering accounting: formation and development of theory. *International accounting*, vol. 46(292), pp. 2–8.

25. Tkach, V. I. and Shumeiko, M. V. (2013), *Engineering theory of accounting*. Azov Print, Azov, Russia.

26. Yatsenko, O. M., Yatsenko, O. V., Nitsenko, V. S., Butova, D. V. and

Reva, O. V. (2019), Asymmetry of the development of the world agricultural market. *Financial and credit activity: problems of theory and practice*, vol. 3, is. 30, pp. 423–434. <https://doi.org/10.18371/fcaptp.v3i30.179821>.

27. Zamula, I., Tanasiieva, M., Travin, V., Nitsenko, V., Balezentis, T. and Streimikiene, D. (2020), Assessment of the profitability of environmental activities in forestry. *Sustainability*, vol. 12(7), 2998. <https://doi.org/10.3390/su12072998>.

28. Zamula, I. V. (2016), Analysis of profitability of environmentally friendly products in marketing research. *Actual economic problems*, vol. 8(179), pp. 317–322.

29. Zhuk, V. M. (2013), Accounting engineering. *The growing role of accounting in the modern economy: a collection of abstracts and reports of the first International Scientific and Practical Internet Conference*, Kyiv, Ukraine.

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