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## THE BASICS OF CREATING IT-PROJECT MANAGEMENT SOFTWARE AND MONITORING THE SOLVENCY OF BANK CLIENTS

***Abstract.** The article is devoted to the study of the main stages of software product development, in particular, the creation of a demo version of the application. This demo version helps to determine whether there is a need for an application aimed at assessing the solvency of bank customers, and also helps to understand what functions are important to users. It also covers the principles of creating a software product that not only works but also meets market requirements. This is achieved by using the market interest testing method, which allows determining whether there is a demand for a particular product or service. Considerable attention is paid to the general grounds for the emergence of credit relations, which arise from commodity production, where the key element of credit functioning is the circulation of value within the commodity exchange. In this process, there is a time gap between the circulation of goods and their monetary equivalent, which leads to the separation of the monetary form of value from the commodity form. However, the turnover of goods is not the only reason for the emergence of credit relations. Nowadays, credit relations arise in any economic or financial transaction related to the debt of one of the parties to such a transaction. The article highlights the importance of user feedback and its impact on the further development of the application. It also emphasizes the need for continuous improvement and adaptation of the product to changing market conditions and user requirements. In particular, the importance of using analytical tools to track user behavior and feedback is discussed, which allows for timely product adjustments. The issues related to the effective management of IT projects, both traditional and flexible methodologies, approaches and techniques used to manage IT projects are considered. The author proposes to use the Scrum method for IT project management and provides recommendations for the effective implementation of IT projects. When bringing an IT product to the market, there are not yet sufficient grounds to conclude that the project is successful, as issues such as the mechanism for selling the product, the level of customer satisfaction, and the need for changes remain unresolved. In addition, the success of an IT project to create a new product cannot be determined by successful implementation alone - it is important to ensure the integrated operation of the developed IT system. Therefore, the success of an IT project is measured not only by its successful implementation but also by the efficiency of its operation, as well as by the product's ability to meet customer needs and bring profit to the company. In addition, it is important to consider that the success of a project depends on many factors, including market conditions, competition, customer needs, etc. Thus, the article provides valuable guidance and recommendations for developing software products that meet market needs and user requirements.*

**Keywords:** borrower (bank client); solvency assessment; IT project management software

### Introduction

In a market economy, businesses cannot function effectively without periodically attracting loans in various forms. This becomes necessary to support the

operations of enterprises, expand business, or overcome temporary financial difficulties.

From a scientific point of view, a loan is a form of borrowed capital that can be presented in cash or in goods. It is granted on terms that provide for its

repayment. This leads to a credit relationship between two parties: the lender who provides the loan and the borrower who receives it.

Expanding on this idea, we can say that credit relations play an important role in the modern world. They help borrowers secure the necessary resources for development and expansion, and provide flexibility in managing cash flows. Loans can be used to finance capital expenditures, such as the purchase of equipment or real estate, or to cover operating expenses, such as employee salaries or the purchase of materials.

However, it is important to remember that lending has its risks. Borrowers need to be sure that they will be able to repay the loan on time to avoid financial problems. Lenders, on the other hand, should conduct a thorough assessment of borrowers' solvency to ensure that the borrowed funds are repaid/

### Objective of the work

The purpose of this study is to consider the identification of the main causes of the emergence, functioning and control of the solvency of bank customers for the management of IT projects.

If the turnover of goods outstrips the turnover of money, enterprises-consumers of goods may face the problem of insufficient funds at the time of payment for them, which may suspend the normal process of reproduction. On the other hand, when money turnover outpaces commodity turnover, enterprises may accumulate temporarily free funds.

Thus, the emergence and functioning of credit is associated with the need to ensure a continuous process of reproduction, with the temporary release of funds at some enterprises and the need for them at others. It is important to note that the emergence of credit relations is not only caused by the fact of a time gap between the shipment of goods and their payment, but also by the parties to the credit relations agreeing on the terms of deferred payment by entering into a credit agreement.

As for individuals, young people under the age of thirty-five are most likely to need a loan. There are two main types of lending: consumer and investment. Consumer lending means that goods or services purchased with a loan are used to meet personal needs. Investment lending, on the other hand, involves investing goods or services in business development.

To obtain a loan, it is important to assess the borrower's solvency. Solvency means that a potential borrower has the conditions for obtaining a loan and the ability to repay it. In other words, it is the ability of a company to pay off its debt obligations in full and within the timeframe specified in the loan agreement. When issuing loans, each bank faces the need to assess the solvency of borrowers. This process is mandatory, and its results have a significant impact on the success of individual loan transactions, as well as on the overall

efficiency of the bank's lending activities. For the borrower, the assessment of solvency is also of great importance, as its results determine the amount of the loan granted and whether it will be granted at all.

### Summary of the main material

In addition to the objective basis, there are specific reasons for the emergence and functioning of credit relationships, which are related to the need to ensure a continuous recovery process.

When assessing a customer's solvency, a bank actually measures the level of credit risk it is willing to accept when establishing a credit relationship with that customer.

The National Bank of Ukraine in its "Regulation on the Procedure for the Formation and Use of Provisions for Compensation of Possible Losses on Credit Operations of Banks" [1] established a mandatory methodology for banks to analyze the financial condition of a borrower.

However, the requirements set out in the Regulation are only minimal, and each bank may develop its own approach, taking into account its specifics, basic principles of credit policy and specific economic conditions. Thus, each bank has the right to independently establish additional assessment criteria that increase the requirements for indicators for adequate assessment of credit risks and effective control over them.

In addition, banks independently determine the significance of each of the indicators proposed by the NBU individually for each group of borrowers, taking into account the industry, seasonality of production, balance sheet liquidity, cash flow, and market position.

The criteria for assessing the borrower's financial condition and the methodology for determining them are documented by the bank in a separate regulation and are an integral part of its credit policy. The methodology includes detailed and technically sound criteria for economic assessment of the financial performance of borrowing customers and methods of analysis.

The choice of the system of indicators and methods depends on the specifics of the market segment served by the bank (industry specifics, category of borrowers), as well as on the level of specialization of the bank (mortgage, investment, trading), types of loans (short-term, long-term), the bank's strategy and policy (reliability, riskiness, aggressiveness), the level of qualification of loan officers, the level of organization and technical support of analytical work in the bank.

In the process of analyzing solvency, it is important to focus on the fact that the most important thing for a lender is the borrower's ability to generate cash flows. For example, in international banking practice, there are cases when banks are willing to lend to those who are unprofitable according to their financial statements, but they generate strong cash flow. An example is US

aviation companies, which, due to large depreciation charges associated with the high cost of aircraft, have a loss in their financial results. However, these companies always have funds on their accounts, which makes them attractive and reliable borrowers.

Consumer lending means that goods or services purchased with a loan are used to meet personal needs. Investment lending, on the other hand, involves investing goods and services in business development [4 – 6].

To obtain a loan, it is important to assess the borrower's solvency. Solvency means that a potential borrower has the conditions for obtaining a loan and the ability to repay it. In other words, it is the ability of an enterprise to pay off its debt obligations in full and within the timeframe specified in the loan agreement (Fig. 1) [4].

An incorrect assessment of borrowers' solvency may lead to a deterioration in the quality of the bank's loan portfolio, which in turn may require additional provisions. In the best case scenario, this could lead to a deterioration in the bank's financial position, and in the worst case scenario, to its complete bankruptcy.

The solution to this problem is to develop and use a sound methodology that will allow the bank to realistically assess the solvency of borrowers. However, it is worth noting that there is no single methodology or single approach to its development. Even the definition of “solvency” may vary, which reflects the diversity of interpretations of this concept. An important element of the solvency assessment is an understanding of the borrower's financial position (Fig. 2), lending history, current liabilities, and ability to generate sufficient income to service and repay the loan. In addition, banks may take into account other factors such as the stability of the market in which the borrower operates, its competitive position, and general economic conditions [8].

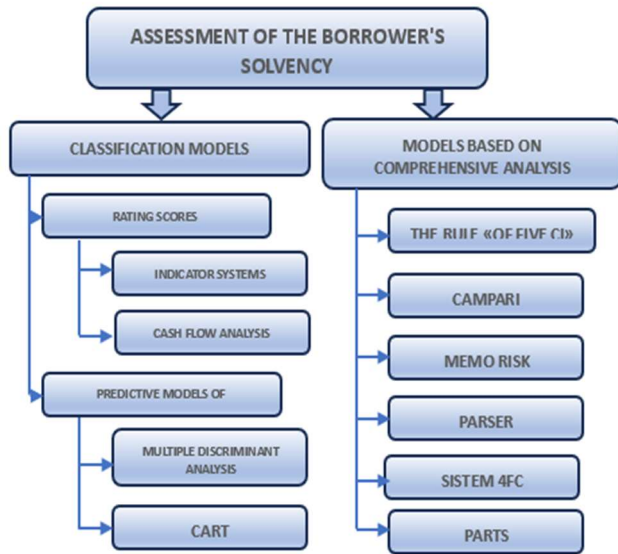


Figure 1 – Classification of approaches to assessing the solvency of bank customers. Source: [8]

In addition to the objective basis, there are specific reasons for the emergence and functioning of credit relations, which are related to the need to ensure a continuous recovery process [4].

As for individuals, the most common need for credit is among young people under the age of thirty-five. There are two main types of lending: consumer and investment.

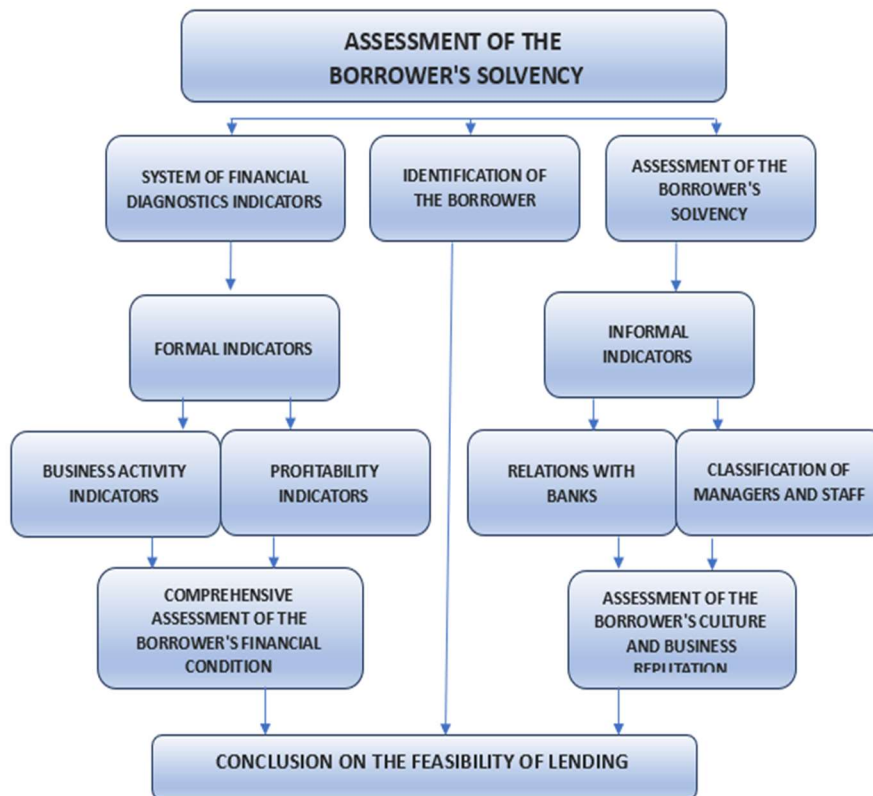


Figure 2 – Procedure for assessing the borrower's solvency [8]

From the perspective of a software developer, the current literature emphasizes the importance of assessing customer solvency. There are many interpretations of this concept, which reflects its evolution depending on the level of development of the country's economy and the context of credit institutions.

To effectively manage a project, plan it, monitor it throughout the continuous implementation process, and achieve successful completion, various methods and processes are used that make up the project management methodology.

Traditional project management methodologies in the IT sector, such as the waterfall model, spiral model, V-model, and others, are based on the principle of the invariability of client requirements and project stages in the development of software products (Fig. 3, Fig. 4).

Basically, these methodologies are effective for IT projects where the client's requirements are stable and clear from the very beginning when the business contract is signed [4 – 6; 10].



Figure 3 – The methodology is process-oriented, not project-oriented – Agile Six Sigma [10]

The PRINCE2 methodology includes seven stages: project launch, management, initiation, stage oversight, product development management, stage boundary management (transition to the next stage), and project completion (Fig. 4).

The detailed approach and documentation of all PRINCE2 processes give project managers and management more control over resources, productivity, personnel, costs, and risks. In addition, this methodology offers clearly defined roles, which simplifies management. However, when flexibility is needed or requirements are constantly changing, this methodology may not deliver the desired result.

However, traditional methodologies have some drawbacks. They are characterized by a low level of flexibility, for example, in case of product redesign; require a large number of experts with different IT profiles and specializations in the team; are characterized by the absence or minimal interaction between the client

and the development team - interaction occurs only at the final stages or just before the final presentation of the project results [7 – 9].



Figure 4 – PRINCE2 methodology [10]

Developers tend to create flexible and adaptive systems that can accommodate these different interpretations and adapt to changes and lending requirements. This may include developing machine learning algorithms for automated creditworthiness assessments, creating intuitive user interfaces for entering customer data, and developing secure protocols to protect this sensitive information. In addition, it is important to develop systems that can easily integrate with existing banking systems and meet regulatory requirements.

In today's IT world, agile project management methodologies, such as Scrum, are increasingly being used to quickly adapt to changes in customer requirements and market conditions. These methodologies provide closer interaction between the client and the development team, which allows for quick changes to the project and provides greater flexibility in the process of its implementation (Fig. 5) [10; 11].



Figure 5 – SCRUM values methodology [11]

Increased competition in the banking sector requires credit institutions to make quick decisions on lending, given the high credit risks associated with lending to the real economy. This creates the need to develop and implement advanced technologies that can assess the level of solvency in a timely manner, including taking into account the specifics of the industry. However, for most banks, combining the efficiency and quality of credit risk assessment in real life is a challenge.

From the point of view of an IT project manager, the key element in the formation of a credit relationship between a lender and a client is the borrower's solvency. This is an assessment that commercial banks determine for each borrower, and it is a crucial condition for concluding a loan agreement. It allows to assess the factors that may affect the repayment of the loan.

Solvency can be defined as the ability of a borrower to pay off its debt obligations in full in cash within the terms set out in the loan agreement. Solvency should be viewed from two perspectives: from the borrower's point of view (where the ability to pay off its debt obligations is determined by a system of indicators) and from the lender's point of view (where the level of solvency determines the amount of the permissible loan). The financial condition of borrowers has been unstable in

recent years, and the lack of their own financial resources for production and economic activities makes them unreliable partners for banking institutions.

The problem of credit support for borrowers is the failure to take into account the specifics and characteristics of the entity when lending and assessing solvency, unstable financial support from the state, underdevelopment of their lending by other credit institutions, and deterioration of their financial condition, which negatively affects their solvency.

## Conclusions

In order to decide on the feasibility and volume of lending for a relatively long period, cash flow analysis is performed not only on the basis of actual data for past periods, but also on the basis of projected data for the future period. Actual data is used to estimate the projected data. The forecast of individual elements of cash inflows and outflows is based on their average value for past periods and planned growth rates of sales revenue.

Predictive bankruptcy models are used to assess the quality of potential borrowers and are based on statistical methods, in particular, on multiple discriminant analysis (MDA), also known as «cluster analysis».

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Стаття надійшла до редколегії 10.03.2024

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**ОСНОВИ СТВОРЕННЯ ПРОГРАМНОГО ЗАБЕЗПЕЧЕННЯ З УПРАВЛІННЯ ІТ-ПРОЄКТОМ  
ТА КОНТРОЛЮ ПЛАТОСПРОМОЖНОСТІ КЛІЄНТІВ БАНКУ**

**Анотація.** Стаття присвячена вивченню основних етапів розроблення програмного продукту, зокрема створення демо-версії застосунку. Ця демонстраційна версія допомагає визначити, чи є потреба в застосунку, що спрямований на оцінку платоспроможності клієнтів банку, а також допомагає зрозуміти, які функції важливі для користувачів. Також розглянуто принципи створення програмного продукту, який не тільки працює, а й відповідає вимогам ринку. Це досягається за допомогою методу тестування зацікавленості ринку, який уможливорює визначити, чи є попит на певний продукт або послугу. Значна увага приділяється загальним підставам виникнення кредитних відносин, які впливають з товарного виробництва, де ключовим елементом функціонування кредиту є циркуляція вартості в рамках товарного обміну. У цьому процесі виникає часовий розрив між обігом товару та його грошовим еквівалентом, що призводить до відокремлення грошової форми вартості від товарної. Однак оборот товарів – це не єдина причина виникнення кредитних відносин. На сьогодні кредитні відносини виникають при будь-якій економічній або фінансовій операції, пов'язаній із заборгованістю одного з учасників такої операції. У статті висвітлено важливість зворотного зв'язку від користувачів та їх вплив на подальше розроблення застосунку. Вона також акцентує увагу на необхідності постійного вдосконалення й адаптації продукту до змінюваних умов ринку та вимог користувачів. Зокрема, розглянуто важливість використання аналітичних інструментів для відстеження поведінки користувачів та їхніх відгуків, що дає змогу вчасно вносити корективи в продукт. Розглянуто питання, пов'язані з ефективним керуванням ІТ-проєктами, як традиційні, так і гнучкі методології, підходи та методики, що використовуються для управління ІТ-проєктами. Запропоновано використання Scrum-методу для керування ІТ-проєктами, а також наведено рекомендації щодо ефективної реалізації ІТ-проєктів. У разі виведення ІТ-продукту на ринок, ще немає достатньо підстав для висновку про успішність проєкту, оскільки залишаються невирішеними такі питання, як механізм продажу продукту, рівень задоволеності клієнтів та необхідність внесення змін. Крім того, успішність ІТ-проєкту зі створення нового продукту не може визначитися лише успішним впровадженням – важливо забезпечити комплексну експлуатацію розробленої ІТ-системи. Отже, успішність ІТ-проєкту вимірюється не лише успішним впровадженням, а й ефективністю його експлуатації, а також здатністю продукту задовольнити потреби клієнтів і принести прибуток компанії. Крім того, важливо враховувати, що успішність проєкту залежить від багатьох факторів, включаючи ринкові умови, конкуренцію, потреби клієнтів тощо. Отже, стаття надає цінні вказівки і рекомендації щодо розробки програмних продуктів, які відповідають потребам ринку та вимогам користувачів.

**Ключові слова:** позичальник (клієнт банку); оцінка платоспроможності; програмне забезпечення управління ІТ-проєктом

**Link to publication**

APA Stepashkina, K., Desiatko, A. & Kurochkin, D. (2024). The basics of creating IT-project management software and monitoring the solvency of bank clients. *Management of Development of Complex Systems*, 58, 61–66, dx.doi.org/10.32347/2412-9933.2024.58.61-66.

ДСТУ Степашкіна К. В., Десятко А. М., Курочкін Д. О. Основи створення програмного забезпечення з управління ІТ-проєктом та контролю платоспроможності клієнтів банку. *Управління розвитком складних систем*. Київ, 2024. № 58. С. 61 – 66, dx.doi.org/10.32347/2412-9933.2024.58.61-66.