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Zhambyl A.*[1], Kenzhibayeva Z.[1], Narbaev T.[1], Castelblanco G.[2]

[1]Kazakh-British Technical University 050000, Almaty, Kazakhstan
[2]University of Florida Gainesville, FL, 32611-5703, USA
*E-mail: aibekzhambyl@gmail.com

THE CHALLENGES OF USING THE AGILE APPROACH WHILE DEALING WITH SUPPORTERS OF THE CONSERVATIVE APPROACH IN PROJECT MANAGEMENT

Abstract. Project management (PM) is one of the most important aspects of modern business and society. Successful completion of projects can ensure the growth and development of organizations, as well as the social well-being of society and the country. As businesses continue to operate in a dynamic environment, the need for a flexible and responsive PM approach has become increasingly important. This led to the popularity of Agile methodology, which emphasizes collaboration, continuous improvement, and customer satisfaction. While Agile has proven successful in many projects, it also comes with its challenges and risks. Therefore, understanding the success and risk factors associated with using Agile is crucial for project managers to plan and manage Agile projects effectively. The aim is to understand if the implementation of Agile is vital to revolutionize PM or if Agile has a placebo effect by presenting numerically represented proofs. The aim of the study is also to identify risk and success factors influenced by the Agile methodology. To achieve this goal, theoretical study of other countries and the practical part. The theoretical part considers the project concept, risk factors and project success. In the empirical part, a questionnaire was used among PM experts to collect primary information. To analyze the results of the questionnaire, the following methods were used: Cronbach's Alpha and Manna Whitney. As a result of the study, risk and success factors were identified in projects positively influenced by Agile. Namely, it increases the probability and influence of success factors and reduces the likelihood and influence of risk factors. These recommendations are for future research. The results of the study can be used to decide on the implementation of Agile methodology and further improve the practical experience of implementing Agile methodology.

Key words: Agile, Project Management, Success factor, Risk factor.

1. Introduction

The relevance of research lies in the increasing popularity of Agile in Project Management (PM) and the need for a clear interpretation of the factors that impact its success and risk attributes. This study can be valuable for project managers and organizations to make a more precise approach when adopting Agile and can improve project outcomes. Additionally, it can aid in identifying areas that require improvement and developing strategies to mitigate potential risks. With the growing demand for Agile, this research is crucial in ensuring organizations have the knowledge and skills to successfully implement Agile methodology. PM is an urgent topic in the modern world, as it allows you to manage resources and achieve your goals effectively. No matter what industry an organization works in or what type of project it leads, PM is necessary for completing tasks and achieving results. Now, Kazakhstan is actively developing in this direction. Firstly, Kazakhstan is actively developing in various fields, including economy, industry, transport and communications, and social infrastructure. To ensure the effective execution of these projects, it is essential to oversee them optimally, reducing potential risks and maximizing achievements. Secondly, Kazakhstan is working to improve the investment climate and attract foreign investment. To use these investments effectively, it is necessary to conduct projects that will be successful and profitable. Finally, Kazakhstan is a member of international organizations such as the World Trade Organization and Organization for Economic Co-operation and Development and participates in international projects. This study can help in the areas mentioned above.

This research aims to explore the factors contributing to the achievement and potential risks related to the utilization of Agile methodology in PM, specifically in multinational corporations. The investigation will analyze the crucial elements that facilitate the effective implementation of Agile methodology and the possible

difficulties and hazards that may emerge during the adoption phase. Additionally, the research will assess the influence of Agile on significant factors influencing both success and risk.

To achieve the research objective, we must answer the following questions. Do companies that use Agile in projects have more success rates than companies with traditional project approaches? Are the factors of risk less in companies practicing the Agile approach than in companies with the traditional approach? How the level of resistance against Agile methodologies can be evaluated? To what extent do project managers find it challenging to implement Agile in projects for traditional companies?

In the research, firstly, the literature review will be done to study the use of Agile in PM thoroughly. Then, the proper questionnaire will be done among experienced project managers to identify the level of Agile in PM in Kazakhstan. Later, the data will be analyzed, and the effects will be discussed based on numerical data.

The paper is organized as follows. We provide the main provisions including the literature review, materials and methods, and the discussion of the main results and findings. The last section concludes the study highlighting its limitation and future research directions.

2. Main provisions

2.1. Literature review

One challenge identified in the literature is resistance to change. The supporters of a conservative approach may resist Agile methodology as it requires a significant shift in mindset and work practices. According to Eklund and Wilson (2018), change resistance can manifest in many ways, including lack of engagement, skepticism, and outright opposition to the Agile approach. This resistance can stem from the fear of the unknown or the belief that the traditional approach has worked in the past and, therefore, should continue. [1], [2], [3]

Another challenge highlighted in the literature is a lack of trust. Conservative supporters may not trust the Agile methodology or the team responsible for implementing it. According to Conboy et al. (2016), trust is essential to implement Agile successfully. Without trust, stakeholders may not believe in the project's goals or the team's ability to deliver, leading to project failure. [4], [5], [6], [7], [8],

Different goals and priorities can also present a challenge when implementing Agile with conservative supporters. According to Hazzan and Dubinsky (2013), the goals of Agile, which prioritize customer value and adaptability, may conflict with the conservative approach, which prioritizes adherence to the plan and minimizing risks. The differing goals can lead to a lack of alignment between stakeholders, which can cause significant problems in project implementation. [9], [10], [11],

Communication is another critical factor identified in the literature that can affect the success of Agile implementation with conservative supporters. According to Beigbeder and Picard (2016), communication issues can arise due to language, terminology, and approach differences. Conservative supporters may not be familiar with Agile terminology, leading to misunderstandings, delays, and other communication issues. [12], [13], [14], [15], [16],

Finally, a lack of understanding of the Agile methodology can pose a significant challenge when implementing it with conservative supporters. According to Boehm and Turner (2013), adopting Agile methodology necessitates a notable shift in mindset and work practices, which can pose challenges for individuals accustomed to more traditional approaches. To address this challenge, organizations may need to invest in training and education to help stakeholders understand the Agile approach and its principles. [17], [18], [19],

The reviewed literature suggests that implementing the Agile approach while dealing with supporters of a conservative approach in PM can be challenging. Resistance to change, lack of trust, differing goals, communication issues, and a lack of understanding are some primary challenges that can arise. Organizations that wish to implement Agile successfully with conservative supporters must address these challenges through effective communication, collaboration, and education. [20], [21], [22], [23], [24].

2.2. Materials and methods

This section focuses on the methodology used to obtain the data for the research. The first part of this section focuses on the methodology to gather the data, and the second part focuses on the interpretation of the numerical data. The analysis is conducted using the data analysis methods and tools.

The data is collected by sending a questionnaire to the top managers of companies who practice the Agile approach from the IT, telecom, governmental, and construction companies. The questionnaire has three

sections and twelve questions are asked. Each question has two parameters for probability and impact values, where six out of twelve questions are related to probability factors and six out of twelve are related to risks. The questionnaire questions include the factors indicated in Table 1. The collected data will later be processed with Excel calculations.

There are three methods used for the research. Firstly, for the study of secondary information - literature review and analysis using the program VOSViewer. As well as a summary table by articles. The next method includes a survey, and qualitative interviews were used to prepare the primary information. Finally, analyzing the results were analyzed using different parameters.

Two methods were used for data analysis: Cronbach's alpha and the Mann-Whitney method. The reliability of the questionnaire was assessed using Cronbach's alpha method. To directly analyze the questionnaire data, we used the Mann-Whitney method. Based on a survey conducted among companies using Agile and not using it, data was obtained that allows us to analyze the impact of Agile on risk factors and success in PM. There were twenty respondents in total. The data obtained were divided into two groups: companies using Agile and companies not using Agile. For each risk or success factor, the U value and the p-value were calculated. The Excel tool was used to calculate, and the following steps were performed. Consider the example of a success factor such as an adequate budget for planning and design projects (impact). The first step is the ranking of the data. The results were ordered in ascending order, and each value was assigned ranks. The second step is the calculation of the sum of ranks. We calculate the sum of the ranks for each company. Let us denote the sum of the ranks of a company using Agile as U1 and the sum of a company not using Agile as U2, where U1=172 and U2=38. The third step is the calculation of U statistics. Calculate U statistics using the formula:

$$U = \min(U1, U2), \quad (1)$$

The fourth step is the calculation of the expected value of U. We determine the expected value of U using the following formula, where n1 and n2 are sample sizes for a company using Agile and a company not using Agile, respectively, where E(U)=42:

$$E(U) = (n1 * n2) / 2, \quad (2)$$

The fifth step is the calculation of the standard deviation (SD). We calculate the SD for the U statistic using the following formula, where SD=12.12:

$$SD = \text{sqrt}[(n1 * n2 * (n1 + n2 + 1)) / 12], \quad (3)$$

The sixth step is the calculation of the Z-statistic value. We calculate the value of the Z-statistics using the following formula, where Z=-2.06:

$$Z = (U - E(U)) / SD, \quad (4)$$

The seventh step is determining the p-value. Using the standard normal distribution Excel formula, we determine the p-value associated with the resulting Z-statistic value, p-value=0.019. The eighth step is deciding. We compare the obtained p-value with the selected significance level (0.05). If the p-value is less than the selected significance level, we reject the null hypothesis and assume that there is a statistically significant difference between the companies. Otherwise, the non-null hypothesis is not rejected, and it is accepted that there are no statistically significant differences between the samples. 0.019<0.05 - we reject the null hypothesis and assume that there is a statistically significant difference between the companies.

2.3. Results and discussion

The results obtained for all factors are presented numerically (Table 1) and graphically (Table 2) below. Green indicates alternative hypotheses confirming the differences between companies using and not using Agile. Red marks companies where null hypotheses are accepted, which confirm the absence of differences between companies with and without Agile. According to data analysis (Mann-Whitney U test), companies using Agile have a greater impact and probability of success factors such as Adequate budget for planning and

designing projects, Clear goals and technical requirements of the project, and Support from stakeholders. Also, according to data analysis (Mann-Whitney U test), companies using Agile have less impact and probability of such risk factors as poor time management and financial risks (including inflation and currency exchange rate changes).

Table 1 – Results of the analysis by the Mann-Whitney method. Numerical values:

Success factors	Values	Adequate budget for planning and design projects		Experienced and qualified team		Adequate financing		Clear goals and technical requirements of the project		Support from stakeholders		Strict project planning and control	
		Im-pact	Proba-bility	Im-pact	Proba-bility	Im-pact	Proba-bility	Im-pact	Proba-bility	Impact	Proba-bility	Impact	Proba-bility
Results	a	0.05											
	U-total	17	24.5	34.5	22.5	28	27.5	0	16.5	0	19	22.5	39
	sig	yes	no	no	no	no	no	yes	yes	yes	yes	no	no
	U-crit	21.56											
	p-value	0.02	0.07	0.27	0.05	0.12	0.12	0.00027	0.02	0.00027	0.03	0.05	0.40
	sig	yes	no	no	no	no	no	yes	yes	yes	yes	no	no
Risk factors	Values	Political instability		Financial risks: inflation and currency exchange rate changes		Legal risks		Lack of procurement materials		Poor time management		Reputational risks	
		Im-pact	Proba-bility	Im-pact	Proba-bility	Im-pact	Proba-bility	Im-pact	Proba-bility	Impact	Proba-bility	Impact	Proba-bility
	a	0.05											
	U-total	40.5	35	28	21	39	40	31	39.5	21	23	34	20.5
	sig	no	no	no	yes	no	no	no	no	yes	no	no	no
	U-crit	21.56											
	p-value	0. 4508	0.2819	0. 1241	0.0432	0.4023	0.4345	0.1821	0.4183	0.0416	0.0585	0.2547	0.0580
	sig	no	no	no	yes	no	no	no	no	yes	no	no	no

Table 2 – Results of the analysis by the Mann-Whitney method. Graphically values:

Success factors	Impact	Probability
Adequate budget for planning and design projects	Yes	No
Experienced and qualified team	No	No
Adequate financing	No	No
Clear goals and technical requirements of the project	Yes	Yes
Support from stakeholders	Yes	Yes
Strict project planning and control	No	No
Risk factors	Impact	Probability
Political instability	No	No
Financial risks: inflation and currency exchange rate changes	No	Yes
Legal risks	No	No
Lack of procurement materials	No	No
Poor time management	Yes	No
Reputational risks	No	No

To summarize, the collected data shows that the success factor with the Agile approach application in projects positively affects the success rate, and the risk factors correspondingly decrease. The results' analysis demonstrates that the minimum requirements for the correct level of data are met.

0.7 is commonly regarded as a benchmark value for Cronbach's alpha by analysts. When the coefficient reaches this threshold or higher, it suggests that the items in the measure exhibit sufficient consistency, indicating reliability. Values close to 0.7 are considered minimally acceptable but fall short of ideal. Nevertheless, it is worth noting that different fields and industries may have varying minimum values for Cronbach's alpha based on their specific requirements and standards. The benchmark results show that success rates for factors 4, 5 and 6 are highly affected by implementing the Agile approach in projects, whereas they are decreased significantly for factors 1, 2 and 6.

3. Conclusion

According to the study results, the success and risk factors positively influenced by the Agile methodology are identified, as well as the main obstacles companies face when implementing Agile. Thus, this work will be useful for companies that doubt the need to implement Agile. For future researchers, there is ground for further consideration of the impact of Agile on other risk and success factors that were not reflected in this work.

The analysis of the conducted research and practical examples allows us to draw the following conclusions. Firstly, Agile methodology helps to reduce risks in projects. Thanks to an iterative and incremental approach, Agile allows early identification of problems and change of plans based on feedback. This helps to reduce the likelihood of critical risks and improve project control. The study determined the impact of Agile on reducing risks such as Poor time management and financial risks (including inflation and currency exchange rate changes). Secondly, Agile increases the probability of project success. Agile's flexibility and adaptability allow teams to respond more effectively to changes in requirements, the market, and the competitive environment. Agile contributes to creating more relevant and successful products through regular demonstrations of interim results and interaction with stakeholders. During the study, the influence of Agile on the increase of such success factors as Adequate budget for planning and design projects, Clear goals and technical requirements of the project, and Support from stakeholders. Thirdly, Agile methodology changes the approach to PM. Instead of rigid planning and consistent execution, Agile offers incremental product development and active interaction with the team and stakeholders. This requires a change in the culture and processes in the organization, as well as the active support of management.

However, it should be noted that implementing Agile methodology may also face certain obstacles and difficulties, such as lack of trust, different goals, and priorities, as well as communication problems. However, these problems can be overcome by improving communication processes, training, and creating trusting relationships. As a result, Agile methodology significantly impacts risk factors and success in PM. It helps to reduce risks, increase the likelihood of success, and provide a more flexible and collaborative PM. The introduction of Agile requires changes in processes, working methods, and the organization's culture and management approach. Successful implementation of Agile methodology can bring significant benefits and improve project results. Due to the scale, time duration, expertise and other reasons, several limitations restrict the scale of the research. The first recommendation is that it is required to consider the limits of this current research. A wider sample in terms of quantity of respondents, wider area of professions, and wider geography is recommended. The second recommendation is to consider the questionnaire. It is recommended to increase the sample size and ask people with distinct roles, workplaces, and departments to understand the common trends rather than derive the answer from the limited areas of fields. The third recommendation is to dedicate more time to getting more responses, which solves the problem of busy seasons. The fourth recommendation is that the risks were not fully covered because there was insufficient data for the Mann-Whitney U test analysis. More data is needed, and deeper research on types of risks can be done.

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Information about authors

Aibek Zhambyl (corresponding author)

Master's graduate in Project Management, Kazakh-British Technical University, Tole bi 59, 050000, Almaty, Kazakhstan

ORCID ID 0009-0006-1091-8108

E-mail: aibekzhambylmail@gmail.com

Zhanel Kenzhibayeva
Master's graduate in Project Management, Kazakh-British Technical University, Tole bi 59, 050000, Almaty, Kazakhstan
ORCID ID 0009-0004-8792-590X
E-mail: kenzhibaeva1997@gmail.com

Timur Narbaev
PhD, Senior Lecturer**,** Kazakh-British Technical University, Tole bi 59, 050000, Almaty, Kazakhstan
ORCID ID 0000-0002-6401-2700
E-mail: t.narbaev@kbtu.kz

Gabriel Castelblanco
PhD, Assistant Professor
M.E. Rinker, Sr. School of Construction Management University of Florida, 315 Rinker Hall, Gainesville, FL 32611-5703 USA, Office: 352-273-0563
ORCID ID 0000-0001-6820-6644
E-mail: gabriel.castelbl@ufl.edu

Авторлар туралы мәліметтер

Айбек Жамбыл (корреспонденция авторы)
Жобаларды басқару магистрі, Қазақстан-Британ техникалық университеті, Төле би көш., 59, 050000, Алматы қ., Қазақстан
ORCID ID 0009-0006-1091-8108
E-mail: aibekzhambylmail@gmail.com

Жанель Кенжибаева
Жобаларды басқару магистрі, Қазақстан-Британ техникалық университеті, Төле би көш., 59, 050000, Алматы қ., Қазақстан
ORCID ID 0009-0004-8792-590X
E-mail: kenzhibaeva1997@gmail.com

Тимур Нарбаев
PhD, аға оқытушы, Қазақстан-Британ техникалық университеті, Төле би көш., 59, 050000, Алматы қ., Қазақстан
ORCID ID 0000-0002-6401-2700
E-mail:: t.narbaev@kbtu.kz

Габриэль Кастельбланко
PhD, Assistant Professor, Флорида Университетінің құрылысты басқару мектебі, 315 Rinker Hall, Гейнсвилл қ., Флорида, 32611-5703 АҚШ, офис: 352-273-0563
ORCID ID 0000-0001-6820-6644
E-mail: gabriel.castelbl@ufl.edu

Информация об авторах

Айбек Жамбыл (автор для корреспонденции)
Магистр управления проектами, Казахстанско-Британский технический университет, ул. Толе би, 59, 050000, г. Алматы, Казахстан
ORCID ID 0009-0006-1091-8108
E-mail: aibekzhambylmail@gmail.com

Жанель Кенжибаева
Магистр управления проектами, Казахстанско-Британский технический университет, ул. Толе би, 59, 050000, г. Алматы, Казахстан
ORCID ID 0009-0004-8792-590X
E-mail: kenzhibaeva1997@gmail.com

Тимур Нарбаев
PhD, старший преподаватель, Казахстанско-Британский технический университет, Толе би, 59, 050000, г. Алматы, Казахстан
ORCID ID 0000-0002-6401-2700
E-mail: t.narbaev@kbtu.kz

Габриэль Кастельбланко
PhD, Assistant Professor, Школа управления строительством Университета Флориды, 315 Rinker Hall, Гейнсвилл, Флорида, 32611-5703 США, офис: 352-273-0563
ORCID ID 0000-0001-6820-6644
E-mail: gabriel.castelbl@ufl.edu

Жамбыл А.[*1], Кенжибаева Ж.[1], Нарбаев Т.[1], Кастелбланко Г.[2]

[1]Қазақстан-Британ техникалық университеті, Алматы қ., 050000, Қазақстан
[2]University of Florida Gainesville, FL, 32611-5703, АҚШ
*E-mail: a.zhambyl@kbtu.kz

ЖОБАНЫ БАСҚАРУДА КОНСЕРВАТИВТІК ТӘСІЛДЕРДІ ҚОЛДАУШЫЛАРМЕН ЖҰМЫС КЕЗІНДЕГІ AGILE ТӘСІЛДІ ПАЙДАЛАНУДЫҢ ҚИЫНДЫҚТАРЫ

Аңдатпа. Жобаларды басқару қазіргі бизнес пен қоғамның маңызды аспектілерінің бірі болып табылады. Жобаларды сәтті аяқтау ұйымдардың өсуі мен дамуын, сондай-ақ қоғам мен елдің әлеуметтік әл-ауқатын қамтамасыз ете алады. Кәсіпорындар динамикалық ортада жұмыс істеуді жалғастырған сайын, икемді және жауапты жобаларды басқару тәсілінің қажеттілігі барған сайын маңызды бола бастады. Бұл ынтымақтастыққа, үздіксіз жетілдіруге және тұтынушылардың қанағаттанушылығына баса назар аударатын Agile әдістемесінің танымалдығының артуына әкелді. Agile көптеген жобаларда табысты болғанымен, оның өзіндік қиындықтары мен тәуекелдері де бар. Сондықтан, Agile пайдаланумен байланысты табыс пен тәуекел факторларын түсіну жоба менеджерлері үшін Agile жобаларын тиімді жоспарлау және басқару үшін өте маңызды. Мақсат Agile-ні енгізу PM-де төңкеріс жасау үшін маңызды ма, әлде сандық түрде ұсынылған дәлелдерді ұсыну арқылы Agile плацебо әсері бар ма екенін түсіну. Зерттеудің мақсаты сонымен қатар Agile әдістемесі әсер ететін тәуекел мен сәттілік факторларын анықтау болып табылады. Осы мақсатқа жету үшін басқа елдерді теориялық зерттеу мен практикалық бөлімде қарастырылды. Теориялық бөлімде жоба түсінігі, тәуекел факторлары және жобалардағы табыстар қарастырылады. Эмпирикалық бөлімде бастапқы ақпаратты жинау үшін PM сарапшылары арасында сауалнама жүргізілді. Сауалнама нәтижелерін талдау үшін келесі әдістер қолданылды: Кронбах Альфа және Манна Уитни. Зерттеу нәтижесінде Agile оң әсер ететін жобаларда тәуекел және сәттілік факторлары анықталды, атап айтқанда, ол сәттілік факторларының ықтималдығы мен әсерін арттырады және тәуекел факторларының ықтималдығы мен әсерін азайтады. Бұл ұсыныстар болашақ зерттеулерге арналған. Зерттеу нәтижелері Agile әдіснамасын енгізу туралы шешім қабылдау және Agile әдістемесін енгізудің практикалық тәжірибесін одан әрі жетілдіру үшін пайдаланылуы мүмкін.

Тірек сөздер: Agile, жобаны басқару, жетістік факторы, тәуекел факторы, проджект менеджмент.

Жамбыл А.*[1], Кенжибаева Ж.[1], Нарбаев Т.[1], Кастелбланко Г.[2]

[1]Қазахстанско-Британский технический университет г. Алматы, 050000, Казахстан
[2]University of Florida Gainesville, FL, 32611-5703, США
*E-mail: a.zhambyl@kbtu.kz

ПРОБЛЕМЫ ИСПОЛЬЗОВАНИЯ AGILE-ПОДХОДА ПРИ РАБОТЕ СО СТОРОННИКАМИ КОНСЕРВАТИВНОГО ПОДХОДА В УПРАВЛЕНИИ ПРОЕКТАМИ

Абстракт. Управление проектами является одним из важнейших аспектов современного бизнеса и общества. Успешное завершение проектов может обеспечить рост и развитие организаций, а также социальное благополучие общества и страны. Поскольку предприятия продолжают работать в динамичной среде, необходимость гибкого и оперативного подхода к управлению проектами становится все более важной. Это привело к росту популярности методологии Agile, которая делает упор на сотрудничество, постоянное совершенствование и удовлетворенность клиентов. Хотя Agile доказала свою эффективность во многих проектах, она также имеет свои проблемы и риски. Поэтому понимание факторов успеха и риска, связанных с использованием Agile, имеет решающее значение для менеджеров проектов для эффективного планирования и управления Agile-проектами. Цель состоит в том, чтобы понять, важно ли внедрение Agile для революции в управлении проектами или же Agile имеет эффект плацебо, путем представления доказательств в числовом виде. Целью исследования также является выявление факторов риска и успеха, на которые влияет методология Agile. Для достижения этой цели проводится теоретическое изучение других стран и практическая часть. В теоретической части рассматривается концепция проекта, факторы риска и успешность проектов. В эмпирической части для сбора первичной информации использовалось анкетирование среди экспертов Управления проектами. Для анализа результатов анкетирования использовались следующие методы: Альфа Кронбаха и Манна Уитни. В результате исследования были выявлены факторы риска и успеха в проектах, на которые Agile оказывает положительное влияние, а именно увеличивает вероятность и влияние факторов успеха и снижает вероятность и влияние факторов риска. Эти рекомендации предназначены для будущих исследований. Результаты исследования могут быть использованы для принятия решения о внедрении методологии Agile и дальнейшего улучшения практического опыта внедрения методологии Agile.

Ключевые слова: Agile, управление проектами, фактор успеха, фактор риска, проджект менеджмент.