

JOURNAL OF APPLIED ECONOMICS AND BUSINESS

VOL. 10, ISSUE 4 – DECEMBER, 2022



Education and Novel Technology Research Association

Journal of Applied Economics and Business

VOL. 10, ISSUE 4 – DECEMBER, 2022

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PREDICTION OF COMPANY FINANCIAL DISTRESS IN INDONESIA USING FUNDAMENTAL AND INTELLECTUAL CAPITAL ANALYSIS

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Abstract

The purpose of this study is to predict the financial distress of Indonesian companies. Financial indicators such as current ratios, debt to equity, return on assets, and sales growth are used as independent variables. In addition to financial ratios, intellectual capital is also used to forecast financial distress. The results of this study show that current ratio, return on assets, and intellectual capital have a negative impact on financial distress, and that debt to equity has a positive impact on financial distress, while sales growth has an impact on financial distress.

Keywords: Financial Distress; Intellectual Capital; Financial Ratios.

INTRODUCTION

A company's profitability and financial valuation have become the focus of investors when investing. Investors need forecasts about companies in term a financial stability and profitability perspective (Lee et al., 2010; Novy-Marx, 2013). This is why predictive models of financial emergencies have become important in accounting and finance (Brüggen et al., 2009; Festa et al., 2021; Sari et al., 2018). The advantage of financial forecasting models is that companies can use current information to forecast the future. In addition, investors can also use forecast results to make investment decisions (Nawaz & Haniffa, 2017).

Financial distress are a factor that companies and investors avoid. Several financial factors such as liquidity indicators and market indicators have positive impact on the level of financial distress (Sari et al., 2018). The existence of financial distress means that investors and creditors tend to be more cautious when investing in and lending to

companies. Not all audit reports contain sufficient information, so stakeholders cannot rely solely on the auditor's information for ongoing business issues (Nadeem et al., 2016). Financial statement fraud is not uncommon in audited reports (Blay et al., 2011). Several cases of Indonesian companies such as PT Envy Technologies Indonesia in 2019, PT Hanson Internasional in 2016, and PT Asuransi Jiwasraya financial statement manipulation. Such fraud will make companies and auditors suspicious (Nadeem et al., 2017; Nadeem et al., 2016; Venuti, 2004). Therefore, the company's management should take prompt measures to overcome the problem of financial distress and prevent bankruptcy when such a situation occurs in the company.

There are several indicators and other sources of possible financial distress (E. I. Altman et al., 2019; Dirman, 2021; Sari et al., 2018; Williams, 2013). A number of studies have been conducted to determine the usefulness of analyzing financial indicators in assessing the degree of financial distress (Akpinar & Akpinar, 2017; Al-Khatib & Al-Horani, 2012; Nazaruddin & Daulay, 2019). Analytics can capture key financial figures from annual financial statements. A good financial report should provide stakeholders (investors and creditors) with information that helps them make policies and decisions regarding investments, lending, etc.

In addition to analyzing financial metrics to predict financial hardship, there are other factors that can have an impact, such as Intangible Assets (Sveiby, 1997). Tangible and intangible resources are the focus of the resource-based view (Barney, 1991). Company's competitive advantage must be based on scarce and unique resources, including employee knowledge and skills, unique production processes and intellectual property. Intellectual capital has at least three components: human capital, structural capital and customer capital (Hashim et al., 2015; Pulic, 2000). These three factors form the basis of competitive advantage and contribute more to a company's financial performance than traditional factors of production. If the company is in poor financial condition, IC contributes significantly to the company's success (Khalil, 2014; Wang et al., 2016).

To predict financial distress, the study uses financial indicators with indicators of current ratios, debt to equity ratios, return on assets, and sales growth. The selection of these indicators is based on the belief that they can generally reflect a company's financial performance and efficiency in order to predict the occurrence of financial distress. Additionally, the study uses IC to predict financial distress given its importance as a firm's competitive advantage.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Investors evaluate a company when they invest in it and look at its financial condition (Osazuwa & Che-Ahmad, 2016). If a company performs well, it becomes more attractive to investors. This corresponds to signaling theory. Signaling theory shows that an



information asymmetry exists between business executives and those interested in information. Managers are required to provide information to stakeholders through the issuance of financial statements (Sari et al., 2018). When a well-performing company gives investors a good signal about its health, seeing that company perform well leads to increased shareholder value and attracts more investors willing to invest in that company.

Current Ratio is a calculation used to determine the level of company's ability to fulfill its current liabilities with current assets. It can be used to detect the occurrence of financial distress (Kasmir, 2013). If liabilities increase faster than assets, then the ratio will decrease and this causes problems, it is possible that the pattern of the relationship between the current ratio and the probability of bankruptcy is negative. Research by Atika et al., (2013) and Santoso et al., (2018) which shows that higher current ratio indicates the decreasing probability of financial distress. If the liquidity ratio is smaller, it will increase the company's opportunities to indicate financial distress conditions. This statement supported by Lisnawati (2018) research's that showing the results that liquidity has a positive effect on financial distress. Meanwhile, research by Murni (2018) shows that the current ratio has a negative effect on financial distress conditions.

H₁: Current ratio has a negative effect on the level of financial distress.

Debt to Equity compares the amount of debt with equity (Haq & Harto, 2019). To be able to pay off the company's debt without having to sacrifice too much of the interests of the owners of capital, the company must have a low debt to equity ratio. The value of equity and the amount of debt used for the company's operational activities must be in a fairly proportional or equal amount (Muflihah & Zakiyatul, 2017). A high DER indicates that the business receives a larger proportion of debt financing than its equity funding. If the company has a high DER, or the number of current liabilities is greater than the number of current assets, it is feared that the company will have difficulty paying its debts. This can trigger financial distress. The study from Muflihah & Zakiyatul (2017) states that there is a positive and significant influence between DER and financial distress, states that DER has a positive but not significant effect on Financial Distress. On the other hand, research of Murni (2018) proves that DER has a negative effect on Financial Distress.

H₂: Debt of equity has a positive effect on the level of financial distress.

Return on assets used to calculate how much net income is obtained from each embedded company asset, the higher the return on assets, the higher the net profit generated (Horne & Warchowicz Jr, 2012). The low return on assets ratio indicates the ability of the company's assets to be less productive in generating profits, and conditions like this will

make it difficult for the company's finances to source internal funding for investment, so this will enter into a financial distress situation and can lead to the probability of bankruptcy (Purnomo, 2018). Muflihah & Zakiyatul (2017) proves that there is a positive and significant effect of ROA on Financial Distress. While Murni (2018) proves the opposite where ROA has a negative effect on Financial Distress.

H₃: Return on assets has a negative effect on the level of financial distress.

Sales Growth is a description of increasing sales from year to year (Kodongo et al., 2015). This indicator also represents economic growth and a company's ability to maintain its economic position within its industry (Kasmir, 2013). Higher the value of sales growth can be illustrated that the company has succeeded in carrying out its activities. Research by Widarjo & Setyawan (2009) proves that sales growth has no significant effect on financial distress.

H₄: Sales growth has a negative effect on the level of financial distress.

Currently, the management of intellectual capital is considered important by most companies (Chizari et al., 2016; Wang et al., 2016). If the company has IC and manages it well, it will have an impact on the market value of the company. In other words, if the capital market is efficient, investors will give higher value to companies with a higher IC value (Ardhiani & Nasih, 2019; Chizari et al., 2016; Khalil, 2014). IC is a valuable resource for competitive advantage, where IC will contribute to the company's financial performance. Company management has a big role to play in improving company performance so that company value increases and makes stakeholders, especially investors happy. Therefore, company management needs to know what things or factors are needed by the company so that the company continues to produce good performance and can minimize financial distress or the potential for bankruptcy. Nadeem et al., (2016) shows that intellectual capital has an effect on financial distress.

H₅: Intellectual Capital has a negative effect on the level of financial distress.

RESEARCH METHODS

The survey data was taken from the annual financial results of manufacturing companies listed on the Indonesian Stock Exchange (IDX) for the period 2017-2019. The sample selection refers to Altman, Haldeman, & Narayanan (1977) who classify companies that experience financial distress and non-distress through their EPS. Based on this, this study uses companies that have negative EPS values for three consecutive years and comparison companies that have positive EPS values for three consecutive years in the 2017-2019 period. The sample obtained is 20 companies consisting of 10 companies experiencing negative earnings per share for three years (distress) and 10 companies experiencing positive earnings per share for three years (non-distress).



The study uses financial indicators consisting of current ratios, debt-to-equity ratios, return on investment, and sales growth to predict financial distress (Nadeem et al., 2016; Ong et al., 2011). This study also applies the VAIC model to measure intellectual capital efficiency (Pulić, 2008).

TABLE 1. INDEPENDENT VARIABLES

Variables	Measurement
Current Ratio (CR)	Current assets/Current liability
Debt to Equity Ratio (DER)	Total liabilities/Total equity
Return On Asset (ROA)	Net incomes/Total assets
Sales Growth (SG)	This year's sales – Last year's sales/Last year's sales
Value Added Intellectual Capital (VAIC)	VACA + VAHU + STVA VACA = VA/CE *) (VA = Out-In; Out = Total income from the sale of goods/services; In = Expenses, except labor, taxes, interest, dividends, depreciation)VAHU = VA/HC STVA = SC/VA (SC = VA-HC)

Financial distress is measured by a dummy score of 0 or 1, with 1 if the company fails and 0 otherwise. This measurement follows several previous studies such as (Al-Khatib & Al-Horani, 2012; Alifiah, 2014; Alifiah et al., 2013; Nadeem et al., 2016). Additionally, this study used logistic regression for data analysis. Using this method of analysis, the coefficients of the independent variables are used to predict the probabilities of the dependent variable (Alifiah et al., 2013).

RESULT AND DISCUSSION

Logistics analysis is carried out through several stages to evaluate the impact of a number of independent variables on the probability that the company will run into financial distress.

Chi-Square	Sig
6,421	0,703

The test of Hosmer and Lemeshow goodness of fit show a chi-square value of 6.412 and a significance value of 0.703. Based on these tests, a hypothetical model is shown to fit the data and is therefore used for further analysis.

Observed	Non Distress	Distress	Percentage Correct (%)
Non Distress	53	7	88,3
Distress	8	52	86,7
Overall Percentage			87,5

This model has a percentage correct of 87.5%. This value indicates a high level of accuracy to continue the next test.

Variable	Coefficient	Wald	P-Value
CR	-.687	.513	.003
ROA	-1.397	.926	.000
DER	.144	.170	.000
SG	1.116	.709	.125
VAIC	-1.469	1.390	.000

The results of the logistic analysis test show that the coefficient value of CR is -0.687, which is significant at 0.003, suggesting that the variable current ratio has a significant negative impact on financial distress. This demonstrates our ability to meet our near-term commitment to ensure the availability of working capital to support company's business to achieve expected returns (Hanafi, 2004; Kasmir, 2013). Having sufficient cash available helps the company to fund various business activities. But if the company is short of funds, the opposite happens. This shows that the more cash a company has, the less likely it is to run into financial trouble, and vice versa. The results of this study are consistent with Fatmawati & Wahidahwati (2017) and Purnomo (2018), which states that CR has a significant impact on financial distress.

ROA has a significant coefficient of -1.397 at 0.000. This means that return on assets has a significant negative impact on financial distress. ROA can be viewed as the level of profitability of the company. Higher ROA indicates higher income growth activity. In line with this statement, the results of the analysis show that higher the ROA, the lower the financial distress, vice versa. The results support Fatmawati & Wahidahwati (2017), which states that there is a significant correlation between ROA and financial distress.

The coefficient for DER is 0.144, which is significant at 0.000, meaning that debt to equity ratio has a significant positive effect on financial distress. DER is a ratio used to value debt. This ratio helps to know how much money the borrower (creditor) has provided to the company owner. For companies, smaller DER is better (Sudjiman & Sudjiman, 2017). The more a company's activities are financed by debt, the greater the likelihood of financial distress as the company is obligated to repay the debt. With a higher DER, the risks faced by the company are also higher in terms of fixed costs, i.e. loan capital and interest expense. A high DER reflects that a company's capital adequacy level cannot guarantee its debt, so the possibility of the company run into financial distress is higher. The results support Muflihah & Zakiyatul (2017) study, which states that DER has a large positive impact on financial distress.

The coefficient value for profit growth is 1.116, which is significant at 0.125. In other words, revenue growth will not have a significant impact on financial distress. Revenue growth is used to measure a company's revenue growth. Revenue growth reflects the



company's ability to increase revenue over time. Rapid growth in sales is not always easily impacted, so the net profit generated is marginal, misses the target, and can even be negative (Dianova & Nahumury, 2019). This may affect the company's financial position and financial difficulties can be considered in the future. This study is consistent with studies Giarto & Fachrurrozie (2020) and Dianova & Nahumury (2019) that showing that increased earnings do not affect financial distress.

IC has a coefficient value of -1.469 and is significant at 0.000 which means that Intellectual Capital has a significant negative effect on Financial Distress. IC is a source of intellectual property, information, intellectual property and experience from internal parties and members within the company that can be used to improve performance and increase company assets (Ardhiani & Nasih, 2019; Istikhoroh et al., 2022). When the company can manage its intellectual capital resources, they will have good IC performance and the possibility of the company run into financial distress decreases (Altman et al., 2019). IC management will make the company survive in the long term and provide more benefits than just doing business activities to generate profits (Bontis, 1999; Dumay, 2012). They also can compete with other companies. The value added and efficiency of IC management will unite the micro and macro levels of the economy. When the company can maintain its performance in generating profits and the structure and strategy of the company is strong, they will survive and avoid financial distress.

CONCLUSION

The study proves that current ratio, return on assets, and intellectual capital have a negative impact on financial distress, while debt to capital has a positive impact on financial distress. On the other hand, based on the analysis results, we found that revenue growth did not affect the financial distress. The results of this study are useful to administrators because research models can be used to predict financial distress. The results can also be used by investors to predict a company's sustainability before making an investment decision. In addition, this study of future research on financial forecasting models can incorporate intellectual capital into research models.

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Hybrid project management as a new form of project management

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Abstract

Hybrid project management has gained significant popularity in recent years. Combining multiple project management methodologies, hybrid project management incorporates advantages from other, more-established methodologies. While the term hybrid refers to any new methodology created from combining two or more existing methodologies, in practice, the hybrid approach generally unites Agile methods with the more-traditional Waterfall model. Hybrid project management follows the structure from traditional project management and flexibility from agile project management. Combining both traditional and agile techniques resolve many situations during project development and can achieve success. This article explains the hybrid project management approach and its advantages over Waterfall and Agile methods.

Keywords: *Traditional Project Management, Waterfall model, Agile methodology, Scrum, Kanban, Hybrid project management.*

Introduction

Delivering projects on time, on budget, and on quality has been and will always be the core challenge every project manager faces. The implementation of different project methodologies such as traditional and agile does not always give the overall benefits what the project managers are expecting. The lack of effective usage of project management methodology leads to poor performance of the projects (McHugh and Hogan, 2011). Project managers needs to choose the proper methodology to gain the project success. However, one project management methodology does not fit all. For complex projects with a need of planning on the front part and agility on the developing part, traditional (structured) or agile methods are not sufficient. In situations like this, the hybrid project management methodology is a good and efficient alternative.

A hybrid model was proposed by Hayata and Han (Hayata & Han, 2011), by mixing both the agile-scrum (Maneva et al., 2017) and waterfall methodologies (Salah et al., 2017). While the term hybrid project management refers to any new methodology created from combining two or more existing methodologies, in practice, the hybrid approach generally unites Agile methods with the more-traditional Waterfall model. The hybrid approach follows the structure

from traditional project management and flexibility from agile project management (Smith and Lewis, 2011). The benefits of a hybrid approach would be focusing on business value, time and costs, customizing the project management methodology to the problem rather than using a single approach and enhancing the quality on complex projects (Baird and Riggins, 2012; Karlstrom and Runeson, 2005; Vinekar et al., 2006, Fewell, 2017; Salah et al., 2017). The hybrid project management approach is often considered for projects to increase stakeholder feedback and reduce the risk and uncertainties (Archer and Kaufman, 2013; Jaziri et al., 2018).

This article explains the hybrid project management approach and its advantages over Waterfall and Agile methods.

Traditional Project Management Approach

Traditional project management methodologies were introduced during the second half of the 19th century, as prescribed models and procedures to manage various projects (Špundak, 2014). In the traditional project management approach, methods and procedures are applied uniformly. It is a linear approach where processes occur in a predictable sequence. The main idea behind defining the rules and methods in advance is to get the defined and clear project boundaries without any changes. The Waterfall model is denoted as the most recognizable traditional model (Baird and Riggins, 2012; Tonnquist, 2012). It is a sequential development planning model, where activities are performed step by step, reducing the risks and uncertainties. Each planned activity should be completed and approved before moving on to the next activity, creating no overlaps of different phases (Tonnquist, 2012). The waterfall model comes with very inflexible pre-requirements, i.e., gaining knowledge about the project requirements, the possible solution, and goals from the beginning of the project. This method is beneficial for industries where technology and requirements remain unchanged during the whole project. On the other hand, in industries like IT, with a rapid change in technology, especially in AI and its application in multiple fields (Koceski and Petreska, 2012; Koceski and Koceska, 2012; Koceski et al., 2014; Serafimov et al., 2012; Koceska and Koceski, 2014), it is very likely that customer requirements will change over time. In those situations, the waterfall model is not very efficient. Changing the project objectives, also require restructuring teams, workflows, milestones, and the entire plan, which is very time and cost consuming. So, the biggest challenge with traditional project management is effectively adapting to changes during a project.

Agile Project Management Approach

Agile project management is a newer methodology that relies on smaller groups and interactive releases throughout a project. Rather than the traditional, rigid model, agile requires team collaboration, outside feedback and flexibility to be successful. Agile project management is an incremental and non-linear approach to project management. It focuses on breaking down large projects into more manageable tasks, which are completed in short iterations throughout the project life cycle, and delivered to the customer. Teams that adopt this methodology are able to complete work faster, adapt to changing project requirements, and optimize their workflow.

Agile approach empowers people involved in the process; builds accountability; encourages diversity of ideas; allows early release of benefits; and promotes continuous improvement. It allows decisions to be tested and rejected early with feedback loops providing benefits that are not as evident in waterfall. In addition, it helps deliver change when requirements are uncertain, helps build client and user engagement by focusing on what is most beneficial, changes are incremental improvements that can help support cultural change. Agile can help with decision making as feedback loops help save money, reinvest and realise quick wins.

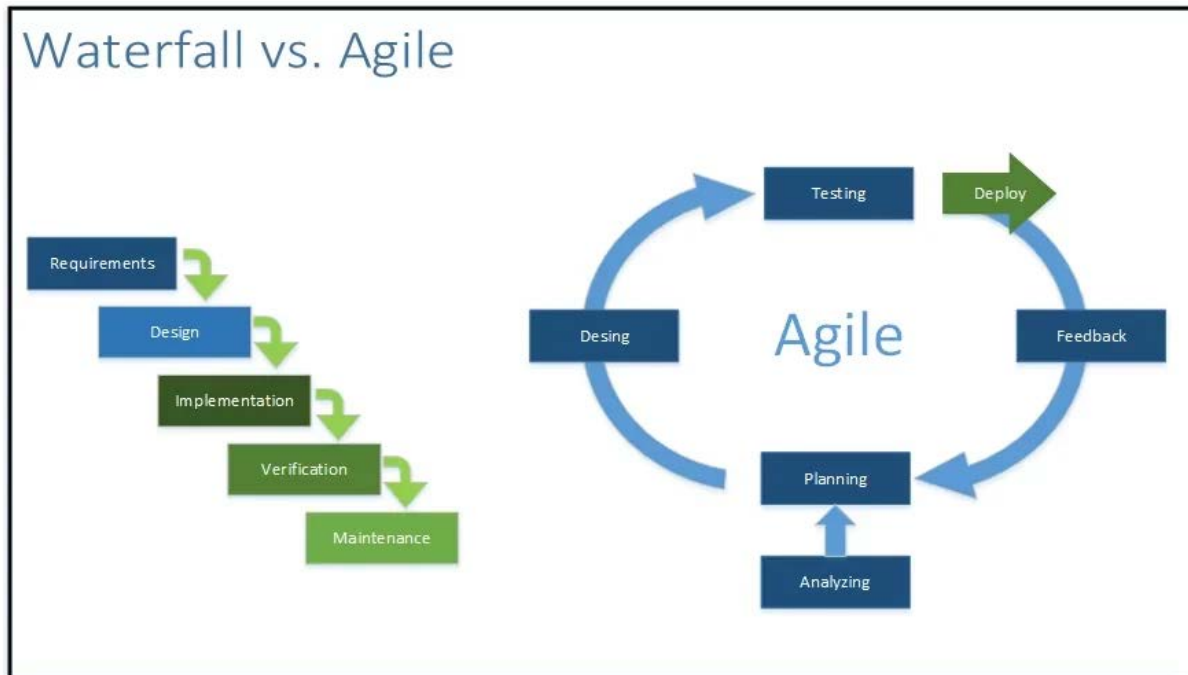


FIG 1. WATERFALL VS AGILE METHODOLOGY

Hybrid project management

Hybrid project management as a concept is not clearly defined in the project management world. The simple definition is that it is a combination of two different methodologies or systems, to create a new and better project management model. It uses elements from each model in order to increase efficiency throughout the software development life cycle.

Hybrid project management is often confused with blended project management. However, blended approaches merge multiple approaches from same category into one. So, it is possible to create blended agile approaches that combine elements of, for example, Scrum and Kanban. (Scrumban), or Scrum and Extreme programming-XP (ScrumXP). On the other hand, mixing traditional and agile approach, results in hybrid approach in project management.

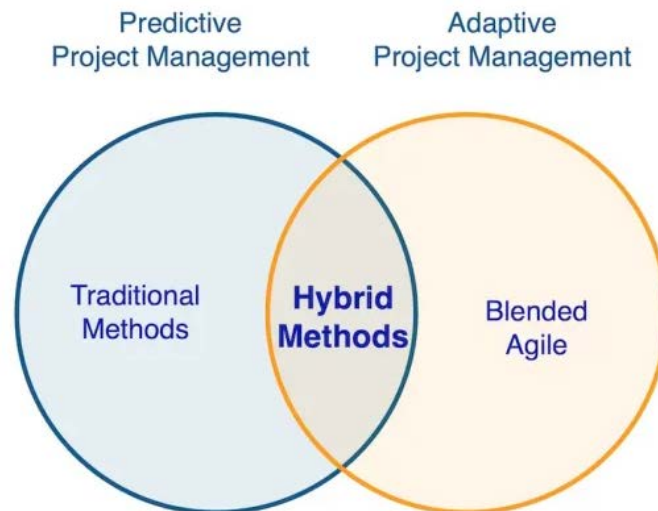


FIG. 2. ILLUSTRATIVE REPRESENTATION OF HYBRID AND BLENDED METHODS.

The hybrid methodology can be a tailored approach that can be changed and altered according to the project needs and requirements. It attempts to use the advantage of one method to balance the disadvantage of others and vice versa.

Scrumban

Scrumban is a project management framework that combines important features of two popular agile methodologies: Scrum and Kanban (Kirovska and Koceski, 2015; Maneva et al., 2016). The Scrumban framework merges the structure and predictable routines of Scrum with Kanban's flexibility to make teams more agile, efficient, and productive (Markovski et al., 2013). It is a good replacement when traditional Scrum methodology doesn't work. In a Scrumban hybrid approach, the features of each method are brought on board. This methodology requires compromising some features to accommodate others. A Scrumban approach requires a high level of transparency and self-managed solid teams.

It is a great solution for teams who need the structure of Scrum with the flexibility of a flow-based method, or for teams who are looking to transition from Scrum to Kanban.

ScrumXP

ScrumXP combines some features of Scrum methodology and Extreme programming-XP, which is another popular agile methodology. XP has laid out some very effective engineering practices that teams practicing Scrum can greatly benefit from. Teams can begin with Scrum and continuously improve by including the robust core XP engineering practices, like pair programming, code refactoring, small releases etc. - not because it is mandated, but because it is found to be effective. Although, interaction with the customer is through a product owner, the Scrum teams can borrow the customer centric approach of XP to remain aligned with customer expectations. In fact, ScrumXP provides the best of both worlds.



OPENTCQ

The OPENTCQ is a hybrid framework, customized from a unified process and the agile model. The model focuses on solving the change management problem. Changes in requirements are difficult to handle by traditional methods because of their rigidity. These changes can be time expensive and lead to overhead costs. On the other hand, in agile, a very skilled team is needed to incorporate the changes during the process. Otherwise, a trade-off between time, cost, and quality has to be made. In this model, the Waterfall method is scaled by introducing a unified process. This increases the agility of the Waterfall method, and changes can be adapted in iterations. At each iteration time, cost and quality are measured and recalculated (Janjua et al.,2016). Some project managers claim that OPENTCQ is better suited for change handling than Scrum and Kanban.

Water-Scrum-Fall

Water-Scrum-Fall is a compound term formed from Waterfall and Scrum. This hybrid approach, which embraces traditional and agile development principles, is also called 'Wagile'. The concept has been proposed by Dave West in 2011 (West, 2011). In Water-Scrum-Fall model the "water" part defines the upfront work, including tasks like requirement analysis, plan building, as well as resource and budget planning. The "scrum" part is used for the development team, to conduct the development phase with the scrum rules and produce product increments in small iteration, including testing. The "fall" part in this method is used for setting the limit to the frequency of software releases. This method shows how combining classic and agile methodologies can lead to a win-win situation. This hybrid methodology allows teams to use whatever techniques best meet the needs to solve the task at hand, at any certain time.

Waterfall-Up-Front and Waterfall-At-End (WUPWAE)

The terms waterfall-up-front and waterfall-at-end is first coined by Cohn in 2009 (Cohn, 2009). It refers to a situation when agile and waterfall coexist. It embeds the scrum rules and framework into the classic waterfall approach. In this method, the framework is divided into two parts. The first part is the part with a high level of abstraction, which needs much planning. The second one, is with a lower level of abstraction, where more flexibility or agility is required. The waterfall-up-front approach can be used when starting a project where more planning is needed and requirements are discussed. This is important because it will lead to contract binding. The development team can use the Scrum framework and rules at the time of development. Coming close to the end, the waterfall-at-end can be applied, which will facilitate the testing and acceptance phase. This hybrid method is also called the "Hybrid V-model".

Benefits of Hybrid Project management

By combining Agile and Waterfall methodologies, hybrid project management offers several clear advantages.

- **Compatibility** - taking the best of both worlds, and allowing for significant project-specific customization, hybrid project management can be easily applied to essentially any team of any size, in practically any industry. This compatibility often makes it the go-to methodology for organizations that need to be able to address a range of project types.
- **Clarity of responsibilities** - hybrid project management clearly maps out entire projects from beginning to end, detailing the full scope of the project and the responsibilities of those who are seeing it through to completion. Employees, managers, and key stakeholders can see immediately where the project is right now, what next steps must be completed to move it forward, and who is involved at each step of the way.
- **Detailed planning** - along with identifying responsibilities, the planning aspect of hybrid project management allows businesses to create detailed plans and accurate cost estimates. Stages are attached to specific deliverables and a clear review process, and predefined sprints enable new features to be delivered quickly and predictably.
- **Flexibility** - taking full advantage of Agile's increased adaptability, hybrid project management allows teams to easily reassess projects mid-development, pivoting where necessary to better address emergent issues and shifting priorities.

Conclusion

In recent years, hybrid project management has gained significant popularity among project managers owing to competitive markets, high customer expectations, and increasingly complex projects. A key benefit of hybrid is that it can be customized for any project. Since hybrid brings the waterfall elements from manufacturing and agile elements from software development, this methodology is compatible with industries and teams of all types and sizes. It also offers the option to reuse software code from past similar projects and finetune it to the needs of future projects, allowing more speed and flexibility.

Hybrid methodologies accept the fluidity of projects and allow for a more flexible approach to project planning and work management. The bottom line is that the more ways you have to approach a problem, the better chance you have of resolving it.

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