AVE Trends in Intelligent Computing Systems

Effective Working Capital Management in the Software Sector: Insights from Ratio Analysis and Financial Statements

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Abstract: All businesses, small, medium, or large, require finance to continue their operations and to meet their target. Finance is so vital nowadays that it's aptly described as the lifeblood of a business. No business can fulfil its goals without sufficient finance. Thus, this paper is concerned with analysing different aspects of working capital management essential to performing day-to-day activities. This paper is concerned with the analysis of "Working Capital Management" in Software Firms. In working capital management, the company is confronted with two important issues: First, based on the level of sales and the corresponding cost considerations, what are the optimal levels of cash, accounts receivable, and inventories that a company should opt to hold? Second, having these optimal quantities, how can these working capital investments be most economically financed? To generate the highest possible performance, companies should have no idle assets and utilise the lowest-cost sources of financing. Why? Generally, it is very favourable for the company to invest in short-term assets and to use short-term liabilities. The scope of the study is determined after and during the study. The primary scope of the study was to apply theoretical concepts in real-life work experience. The working capital study is founded on tools such as Ratio Analysis and the statement of changes in working capital. Additionally, the study is founded on last year's Annual Reports of Software Companies.

Keywords: Working Capital Management; Optimal Amounts; No Unproductive Assets; Real Life Work Experience; Software Companies; Short-Term Obligations; Financing Working Capital; Debtors and Circulating Assets.

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1. Introduction

Working capital is a crucial factor in the survival and viability of any enterprise, as most enterprises are compelled to shut down due to their inability to settle short-term obligations, as highlighted in research work conducted by past studies [12]. Efficient working capital management is crucial for improving liquidity and financial well-being, as well as risk management, as evidenced by research efforts implemented by industry practitioners [9]. Working capital comprises the company's investment in near assets, including inventories, accounts receivable, short-term investments, and cash balances, all of which are crucial for daily operations, as noted in working capital studies by Gill and Biger [2]. These funds are financed by long-term and short-term obligations, and funding processes are specified in the finance manager's plans [4]. Bank overdraft and suppliers' credit, for instance, are a lucrative means of financing current assets, as research documented in the working capital practices report [5]. The terminology of working capital is inaccurate, in the sense that many diverse definitions exist, but current liabilities minus current assets, which is net working capital, is the most utilised definition, as per evidence applied in recent research [6].

Current assets are applied in company operations and can be realised within one year, as required in work conducted by finance practitioners [9]. There may be long-term investments that can be realised in cash but not in cash equivalents. However, they are not included under current assets but come under the field of working capital management, as per research embraced by financial professionals [8]. Key elements of working capital include inventories, i.e., material and products held for production or sold as finished products, on inventory management research [1]; accounts receivables, i.e., customers' short term debt, on studies employed by organizations [10]; prepayments, i.e., advance payments for goods or services to be earned in the future, on financial planning studies [11]; and short term investments, i.e., excess money invested in securities where there is a high probability of return, on research employed by investment planners [1].

Working capital management is concerned with managing current assets and the movement of current liabilities. Working capital management helps the company sustain liquidity, as described in financial resource management literature [2]. Accounts payable, bills payable, and outstanding expenses are current liabilities, which must be paid within one year, utilising current assets or revenues. The primary objective of working capital management is to ensure the firm has sufficient working capital to avoid bankruptcy or insolvency. The working assets should be adequate to pay off current liabilities with a cushion. All current assets must be managed, as high values of all assets will reduce liquidity. Working capital sources management is also necessary, as it provides for the utilisation of the company's resources.

The current asset to liability ratio is the prime theory of working capital management. Working capital management keeps a firm financially healthy with the capability of paying its short-term obligations, a concept which has been vigorously debated in the business finance literature [1]. Therefore, for any business to sustain its operations without cash flow problems, it is crucial to maintain a balanced relationship between its assets and liabilities. Working capital management involves balancing and tracking the company's short-term assets and liabilities to prevent financial constraints due to illiquidity, as suggested by the literature [12]. There will be a need for effective management of working capital to avoid overextension or underutilization of funds, both of which are detrimental to the financial well-being of a firm. This aspect has been researched well in the literature applied by practitioners [3].

In operations, this is synonymous with handling assets and other sources of cash flow in a manner that the firm can service frequent payables from the available liquidity without so much investment in non-producing assets. As has been outlined in the work undertaken by financial planners [4], the goal is to design a system wherein assets already present are properly utilised and short-term resources are harnessed such that the company is properly capitalised to run efficiently. The dilemma is, however, to find a balance for working capital items like inventories, receivables, and short-term investments without encroaching on the business activities of the company, as highlighted in the study on financial strategies [8]. Effective inventory control, however, can help working capital since too much inventory can hold up cash and affect liquidity, while not enough inventory will hinder manufacturing and selling. Accounts receivable, as company liabilities, also form a critical element of working capital management since delayed payments result in cash flow problems, as pointed out in work used by cash flow management experts [6].

Prepayments and short-term investments, although critical elements of working capital, must be managed with care to avoid excessive cash outflows, which can create liquidity pressure, a feature emphasised by financial risk management literature [7]. Reconciliation of current liabilities and current assets is a primary concern in working capital management, as both must be managed together to avoid financial trouble, as suggested by research embraced by finance professionals [8]. Bank overdraft and suppliers' credit are regular work capital management practices. But a business must ensure that such liabilities are dealt with properly so that financial problems do not arise, according to studies on short-term finance management processes [9]. Proper utilisation of short-term finance allows businesses to minimise the use of long-term financing and remain financially versatile, which is crucial for ensuring their continued operation.

Working capital management involves not just managing the short-term assets and liabilities but reconciling the two so that the company will not give up its ability to invest in future growth opportunities for the sake of paying off the short-term financial

obligations. As financial resource management analysts Aldubhani et al. [10] have noted in print, the amount of working capital that an organisation holds and keeps is its passport to long-term profitability and success. Current assets and liabilities must be strategically managed, with consideration given to the company's general financial health and operational requirements. The assets and liabilities balance is the foundation of the working capital management theory. It should be tracked and reconciled periodically to ensure that a business firm is financially stable and in a position to accomplish its business objectives. It is on the success of working capital that any working capital plan is developed, with recommendations being implemented by financial planners [11]. By knowing and managing the most crucial components of working capital, companies can reduce financial risk, enhance liquidity, and make themselves market competitive, as is firmly proven through finance planning and management research [12].

1.1. Objective of the Study

- Meet day-to-day cashflow needs.
- Pay wages and salaries when they fall due.
- Pay creditors to ensure continued supplies of goods and services.
- Pay government taxation and providers of capital dividends.
- Ensure the long-term survival of the business entity.

2. Literature Survey

Some previous research has determined the relationship between working capital management and a firm's profitability in various contexts. The research was aggregate and dealt with inventories of the private industry of the Indian economy as a whole for the period 1948-61. Sales were utilised in this research to indicate a demand for the commodity and indicated the necessity of an accelerator. The short-run rate of interest has also been significant [1]. Working capital management is the management of short-term or current assets and short-term liabilities. That process aims to ensure that the firm has enough assets to run a business. The facts mentioned below are what you need to know about working capital management [2]. Research gathered a sample of 8,872 small and medium-sized firms (SMEs) in Spain for the year 2002-2003. They applied panel data techniques to test the impact of working capital management on the profitability of SMEs.

The findings, which were consistent with the existence of endogeneity, indicated that managers would be able to generate value by decreasing their inventories and outstanding days for their accounts. Moreover, minimising the cash conversion cycle enhances the profitability of the firm [3]. Efforts to expand working capital by postponing pay to creditors are self-defeating to individuals and society as a whole. Arguments that changing debtor and creditor levels between individual levels will seldom have any net effect when a system of values is in place. Laments that stock reduction lowers system-wide financial returns and other significant advantages [4]. One of the studies employed 58,985 years of companies for the period 1975-1994 in their effort to study how the net trade cycle used to determine the efficiency of working capital management is associated with corporate profitability. They, in both instances, established a strong negative association between profitability and the duration of the firm's net-trade cycle [5].

The association between the profitability of the firm and the level of liquidity is indicated by the current ratio. Such an association is more common for companies with high current ratios and long cash conversion cycles. At the industry level, the cash gap or the cash conversion cycle is more significant as a liquidity measure than the current ratio, influencing profitability. The variable for firm size was found to have a meaningful influence on profitability at the level of the industry [6]. Research examined the relation between working capital management and the profitability of a sample of 1,009 large Belgian non-financial firms over the period 1992-2002. The analytical outcome revealed a negative gap between profitability, as captured by gross operating income and cash conversion cycle, and days' accounts receivable and inventories. Less profitable companies have longer payment periods for settling their bills [7]. “Cash is the lifeblood of business” is a common maxim for financial managers.

Current or short-term assets management by financing is called management of working capital. Short-term liabilities are creditors, trade advances, borrowings, and provisions. The focus of attention remains, however, on short-term assets, as short-term liabilities come into focus in the backdrop of short-term assets. Firms need to reduce risk by efficient working capital management [8]. A study examined the correlation between the company's working capital management and profitability at the Athens stock exchange of a listed firm. Using a sample of 131 listed companies from 2002 to 2005, the study examined this correlation. The regression test result showed that statistically, there was a significant relationship between profitability, which was calculated in terms of gross operating profit, and the cash conversion cycle. From that, they argued that the managers would be able to generate value for the shareholders by efficiently managing the cash conversion cycle and maintaining each of its distinctive components at an optimum level [9].

A researcher chose a sample of 94 Pakistani companies listed on the Karachi Stock Exchange for 6 years, 1999-2005, to investigate the effect of various variables of working capital management on the net operating profitability. The research outcome revealed a negative correlation between variables related to working capital management, including the average collection period, inventory turnover days, cash conversion cycle, and profitability. They also learned that the natural logarithm of sales, i.e., firm size, and profitability were also positively related to each other [10].

Research analysed the effect of working capital management on the profitability of a sample of 8,872 Spanish small and medium-sized enterprises (SMEs) during the period 2002-2003. They found that managers can create value by reducing their inventories and the days for which their accounts are outstanding. In addition, reducing the cash conversion cycle also increases the profitability of the firm [11]. One study examined the correlation between profitability and working capital for pharmaceutical companies in India. It said that there are two schools of thought on this issue: one school of thought held that working capital is not responsible for improving profitability, and there can be an inverse relationship between them, while the other school of thought held that investment in working capital is a great contributor to the enhancement of corporate profitability, and without a minimum level of investment of working capital, production and sales cannot be sustained-in fact, the non-availability of working capital will render fixed assets idle [12].

An investigation attempted to evaluate the working capital components and the impact of working capital management on Hindalco Industries Limited's profitability between 1990 and 2015. Research findings showed that the current ratio, liquid ratio, receivables turnover ratio, and working capital to total assets ratio significantly impacted Hindalco Industries Limited's profitability [13]. Working capital management, in the context of an increasingly globalised economy, value maximisation and shareholders, and value creation for the firm, are regarded as the key objectives of business companies. This study clarifies that working capital management can enable a firm to achieve its objective of value creation in the context of value-based management. Working capital management is revealed to impact the operating performance and new firm growth of new public firms.

The study also illuminates working capital's association with the debt level, firm risk, and industry. It concludes a positive and significant connection between greater levels of accounts receivable and operating performance. The study also concludes that being at control (i.e., lower levels) of cash and securities, inventory, fixed assets, and accounts receivable. The working capital usually results from four fundamental factors that comprise the level of sales volume, technological changes, cyclical and seasonal fluctuations, and firm policy. The success of the firm depends on the dependency of the working capital, as shown above. Still, this working capital is independently dependent on the level of the firm's sales volume. Current assets are required for the company to fund and sustain its operational activities. By current assets, following Kothari [4], we refer to those assets that can be readily exchanged for cash, for instance, within one year, receivables, inventories, and cash.

A research work by Mazlan and Leng [13] tried to explore the conventional inter-linkages among the policies of working capital management and profitability of a company in a sample of 204 listed non-financial companies of Karachi Stock Exchange (KSE) for the period 1998-2006. The research established substantial variation in their working capital needs and financing strategies in various industries. Furthermore, regression results found a negative relationship between firms' profitability and the degree of aggressiveness of working capital investment and financing policies. One of them attempts to extend previous studies on the nexus between working capital management and profitability. A sample of 88 US firms listed on the New York Stock Exchange for 3 years between 2006 and 2015 was used. They discovered that there exists a statistically significant association between the cash conversion cycle and profitability, as measured by gross operating profit.

Another study, Gill and Biger [2], attempted to clarify the relationship between Working Capital Management (WCM) and firm performance. They selected the Malaysian listed companies for analysis purposes. They carried out market valuation and a profitability perspective. They utilised a pool of 172 listed firms from Bloomberg databases. They utilised five years' data randomly (2004-2008). This study, like the cited study above, tested the impact of the size of the component of working capital, i.e., CCC, current ratio (CR), a current asset to total asset ratio (CATAR), a current liability to total asset ratio (CLTAR), and debt to asset ratio (DTAR) in reality to firm's performance, wherein the value of firm's size was utilized as Tobin Q (TQ) and profitability i.e., return on asset (ROA) and return on invested capital (ROIC). They used two methods of data analysis: multiple regression and correlation. They determined that there is a negative correlation between working capital variables and the performance of the firm.

A study by Vuković and Jakšić [9] claimed that the profitability and liquidity of the firm are influenced by working capital management. Data collected from pooling were used in conducting research from 2007 to 2009 to evaluate the companies listed in Vietnam's stock market. The research proved that the above variables were highly negatively correlated. It is here that an increase in the cash conversion cycle causes a decrease in profitability. It is also found that profitability will be enhanced if the days of accounts receivable and inventories are reduced. Another research by Mavruk [12] discussed the significance of fixed and working assets to the efficient functioning of any organisation. It has a direct bearing on profitability as well as liquidity.

There has been a business trend: most firms widen the margin of profits and losses because this policy reduces the working capital to sales ratio. But if firms wish to enhance their liquidity, they must raise their working capital. Due to this policy, the firm must reduce its sales, and hence, this action will impact profitability. One study analysed the effect of working capital management on performance.

The data was gathered between 1993 and 2009 from listed companies on the Nairobi stock exchange. Some of the findings of the study were derived from the estimation of fixed effects regression models. It was revealed by Lefebvre [11] that there is a negative correlation between the number of days for which the customers' cash is collected and the productivity of the firm. It implies that the more profitable firms have shorter cash collection days from customers compared to less profitable firms. Secondly, there is a positive correlation between the inventories at introduction, the duration for which they are available, and the profitability of the firm. The reason is that the firms or companies spend more time holding the inventories and minimising the cost of process disruption in production. Generally, the company loses because the product is not good enough. The scenario reduces the company's operational cost. The third assumption made in the study was the correlation between the mean payment period and profitability, and this was confirmed to be positive. The longer it takes to pay out the creditors, the greater the profitability. Money in our modern economy is characterised as providing money when money is needed.

Any enterprise, whether small-scale, medium-scale, or large-scale, needs finance to continue its activities and achieve its desired goal. In the real world, finance is such a requirement today that it can rightly be termed as the lifeblood of any business. Without enough finance, no enterprise can accomplish its objectives. An enterprise has to be suitably balanced between liquidity and profitability in conducting its day-to-day business. Liquidity is essential to ensure the company can fulfil its near-term commitments, and its constant flow can be guaranteed from a profitable paper. The significance of cash as a measure of sustained financial health cannot be unexpected in light of its irreplaceable role in business, according to Seth et al. [6]. This necessitates that companies need to be operated both profitably and efficiently.

In so doing, there is a potential for asset-liability mismatch, which would maximise the firm's profitability in the short term at the cost of insolvency. Or, extreme cautiousness regarding liquidity will come at the cost of profitability. Therefore, the manager of a business firm faces a dilemma of tradeoff to attain the optimal tradeoff between liquidity and profitability to maximise the value of a firm. Working capital management addresses the most volatile areas in finance, and it requires continuous interaction between finance and other functional managers. The finance manager alone cannot enhance the working capital position. There have been several case studies of working capital management in various companies over the last few years, aiming to provide in-depth insights for working capital management professionals. The conclusions of such research not only shed new light on the technical inadequacies of working capital management activities of involved companies but also provide intellectuals and researchers with the ability to create fresh ideas, approaches, and techniques for efficient working capital management. All attempts have been made to do a critical study of working capital management with specific reference to Hindustan Newsprint Limited, Kottayam.

3. Conceptual and Theoretical Review

This paper aims to examine the interrelationship between working capital management (WCM) and firm performance, and to determine the factors that affect WCM, based on a comprehensive literature review. The study will chart knowledge gaps in the current body of knowledge and provide potential avenues for future research in the area. Work-capital management has generated enormous scholarship over the last decade, particularly since the 2008 financial crisis, which highlighted the need to manage capital effectively to secure finance. The issue of WCM has been a pervasive research theme in research and business management for decades, yet despite great interest, remarkably little explicit study concerning WCM and business performance has been undertaken.

The literature is currently mostly based on publicly disclosed financial information and key performance indicators within the companies' annual reports. However, there is an increasing need to research further into WCM under economic uncertainty across the world and turbulent financial markets. Therefore, there is a clear shift of focus towards generating liquidity internally from the operations of the firm, and increased interest in the composition of working capital. Nonetheless, to address this increasing relevance, there is a strong need for more qualitative empirical research, an aspect that has lacked attention in the literature.

The research in this study will attempt to integrate the existing body of knowledge in WCM and evaluate the precise factors most affected by poor WCM practice. In addition, the paper aims to establish potential avenues for future research, thus expanding the existing body of knowledge. To attain this objective, a systematic review of literature on available studies on WCM was performed, with Google Scholar being used as the main source of data retrieval. Articles that had citations of 50 and above as of June 5, 2018, were considered alone in the analysis. These articles were subsequently coded according to recurring themes, and then a close content analysis was conducted in an attempt to identify key findings and trends.

The citation-based analysis shows that the research on WCM has been more popular in recent years, which is consistent with increasing interest in the area. However, it is also noted that most of these high-impact research studies are published in journals with comparatively lower intellectual reputations. Such an observation warrants further reflection regarding the issue of what type of material these researchers cover, which has been categorised into five different types. The most popular theme among the most-cited papers in this category is how WCM is associated with profitability, indicating that most authors have been keen to discover how effective working capital management can contribute to a firm's bottom line directly.

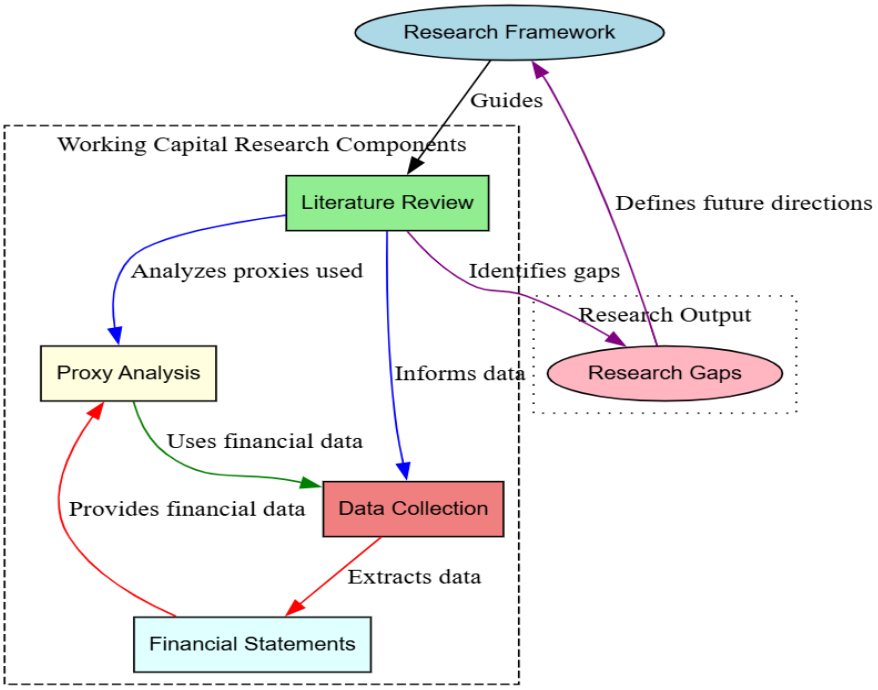

Figure 1: Working capital management research framework

Figure 1 presents the conceptual framework of the most critical aspects of working capital management (WCM) studies and their contributions to firm performance. It's a Research Framework model that serves as the impetus for the whole study, connecting a line of things like Literature Review, Proxy Analysis, Data Collection, Financial Statements, and Research Gaps. Literature Review assesses earlier work and guides Proxy Analysis and Data Collection by identifying lead proxies and variables reported in WCM literature. Financial reports hold the necessary information used in the tabulation of data relating to working capital efficiency analysis and its impact on profitability. Proxy Analysis uses accounting figures in proxying testing in instances of effective working capital management.

Next to it is the node Research Gaps, which presents the result of a literature review, along with research opportunities and under-researched themes. Information flow is where the diagram takes place, with all components feeding and supporting one another. Literature Review relies on Proxy Analysis and Research Gaps, while Proxy Analysis and Data Collection depend on Financial Statements to gather relevant information. Besides that, the model also rolls out the dynamic dimension of WCM research in a way that follows research guided by emergent knowledge constructed and ignorance frontiers. Plotting all these aspects in geography on the map, the diagram indicates a call for periodic empirical research and paradigm-breaking research problems in working capital management, with hopes of acquiring wisdom regarding its position towards business performance.

Another key insight of the content analysis is the frequent employment of the same small range of proxies for most of the studies, something that can conceivably lead to many well-cited publications appearing in category B journals. The application of the same proxy in different studies has the potential to constrain the research boundaries and calls for more creative solution strategies in later research. Drawing from these results, this research discusses the scope of current WCM research and gives some possible research questions for future research in this field. The research first provides a summary of the most researched domains under WCM and indicates the increased interest in this subject by the recent research activity on the topic.

This gives academicians an idea of what their future research domains should be based on what has already been done and researched. The study also identifies the most frequently published research on WCM in journals, which can motivate future researchers to conduct research in this field. Even with increasing popularity for WCM research, the study indicates that the

majority of the influential articles are located in lower-graded, academically ranked journals. The trend also opens room to pose why it is happening, and this research answers this trend by making assumptions of potential reasons causing publication trends as identified. By highlighting these publication trends, this study invites more quality research on WCM that can be published in leading journals.

The findings of this study can also help finance managers to recognise the adverse effects of ineffective WCM practices. Ineffective working capital management can result in liquidity issues, operational inefficiency, and lower profitability. Knowledge of these implications may assist organisations in streamlining their financial decision-making processes and applying cautionary approaches. Lastly, the present study forms a platform for subsequent studies and acts as an impetus to research other study themes in the domain of WCM.

The paper categorises existing studies on WCM into five major themes and conducts an extensive content analysis to assess the efficacy of the proxies applied in studies. Content analysis indicates that proxies and inputs underpinning effective WCM vary, and emphasises that future studies should embrace varied proxies to achieve knowledge advancements in the area. The research also creates broad gaps in the literature that create a chance for further exploration. To the authors' knowledge, such an extensive review of the literature on WCM, especially one that categorises research by dominant themes and canvases proxy inputs utilised, is a rare contribution to the literature. This paper thus provides a critical missing link in the literature. It serves as the foundation for future research efforts that can enhance the richness of knowledge in working capital management and its influence on organisational performance.

4. Results

The findings of working capital management (WCM) studies in software firms offer several interesting insights into working asset and liability management in the speciality industry. Software firms are likely to face problems quite different from those of firms operating with traditional manufacturing or service-type firms, mainly due to the intangibility of their product and the higher relative investment in research and development (R&D). The findings indicate that the aggregate software business experiences minimal turnover in its stock, consistent with the quality of its products, given that physical products are not manufactured. The firms would rather focus on cash balances and receivables than. In receivables research, the management of receivables by software companies, typically aimed at reducing days' sales outstanding (DSO), results in higher liquidity and profitability.

Reducing the DSO would mean that money would be realised earlier by the company, improving cash flow and allowing it to invest in business operations, for instance, product improvement and expansion. On the other hand, firms with longer DSO periods are likely to experience liquidity constraints. They will constrain their capacity to invest in business opportunities or service the needs of day-to-day business operations, which will affect their performance negatively. Working capital calculation is given as:

$$WC = \left(\frac{R}{Revenue} \times 365\right) + \left(\frac{I}{COGS} \times 365\right) - \left(\frac{P}{COGS} \times 365\right) \qquad (1)$$

Where: R =Receivables, I = Inventory, P= Payables, COGS =Cost of Goods Sold.

Table 1: Working capital and financial efficiency metrics for seven companies

Measures	Company A	Company B	Company C	Company D	Company E	Company F	Company G
Receivables (Days)	30	45	60	40	25	50	35
Cash Reserves (%)	10	15	20	5	25	10	15
Inventory Turnover (Days)	0	0	0	0	0	0	0
Payables (Days)	40	55	45	35	50	60	42
Revenue Growth (%)	8	12	7	9	11	6	10
R&D Investment (%)	20	18	15	25	22	19	21
Profitability (%)	12	10	8	14	11	9	13

Table 1 shows key working capital indicators, which are essential while analysing how well companies are handling their short-term assets and liabilities. The Receivables (Days) indicator captures the time a firm takes to settle its receivables. Company E collects its receivables within the shortest time of 25 days, demonstrating good credit control. In contrast, Company C collects its receivables within the longest time of 60 days, which may be demonstrating poor cash flow. Cash Reserves (%) is the

percentage of total assets that is held in cash to meet unexpected expenses. The leader, Company E, has 25% of the total, indicating its ability to accommodate unplanned spending.

In contrast, Company D, with the least liquidity, has only 5%. Inventory Turnover (Days) proves not very useful for software companies (as indicated by zeros for all the companies), as they do not have physical inventories. Payables (Days) is the number of days that companies take to settle their suppliers. Company D takes the shortest time with 35 days, suggesting a quick payment culture, while that of Company F is the longest at 60 days, indicating a slower payment process. Revenue Growth (%) for each company is measured against Company B, with a 12% growth rate indicating good growth, and Company F, which has the lowest growth rate at 6%. R&D Investment (%) measures the proportion of revenues invested in research and development. Company D registers the highest investment rate of 25%, showing the highest orientation towards innovations, followed by the lowest being that of Company C at just 15%. Profitability (%) is the percentage of Revenue converted into profit, with the highest profitability of 13% among them being that of Company G. The Liquidity ratio is:

$$\text{Liquidity Ratio} = \frac{CA}{CL} \qquad (2)$$

Where: $CA = Current$ Assets, $CL =$ current liabilities.

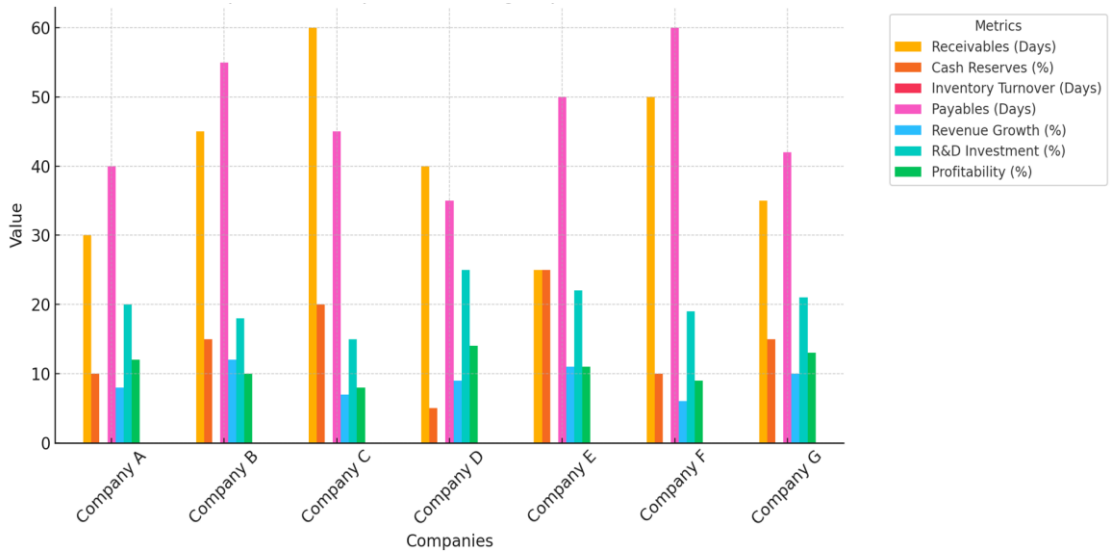

Figure 2: Working capital variables along with the key financial indicators

Figure 2 illustrates seven companies' working capital variables along with the key financial indicators. Each of the indicators has a bar used, such as Receivables (Days), Cash Reserves (%), Inventory Turnover (Days), Payables (Days), Revenue Growth (%), R&D Investment (%), and Profitability (%). Financial company strategies are revealed through variations in the graph. For example, Company E possesses the highest Cash Reserves of 25%, reflecting a conservative cash policy. In comparison, Company D possesses the highest R&D Investment of 25%, which reflects increased investment in research and development.

Inventory Turnover reveals zero values for all companies, as is typical in the software industry's requirement for low or zero inventories. Company F also has the largest Payables (60 days), which could be a sign of delayed payments or good credit terms. Company C also has the largest Receivables (60 days), which may indicate delayed payments by customers. It is simpler to compare with visualisation, and it provides information on the working capital management policies of each firm, allowing trends in liquidity and efficiency to be identified. Days Sales Outstanding (DSO) is given below:

$$DSO = \frac{R}{Revenue} \times 365 \qquad (3)$$

Where: Receivables.

Cash management is also warranted by literature evidence as one of the key drivers towards the attainment of success in software firms. Firms with better access to their resources held in reserve in cash are better placed to deal with changes in their business needs and the overall position of the market. Effective cash management allows firms to benefit from better flexibility in capital decisions, such that they can respond to unexpected costs or take advantage of expansion opportunities. The study

recommends that software firms with sound cash management strategies are better placed to ride financial storms with ease compared to other firms that do not give much consideration to this aspect.

The study also recommends that software firms, especially those that are not part of massive conglomerates and are in the early stages of their development, employ more internal finance. This is an evolution of other firms in other sectors that can potentially be highly reliant on third-party capital, e.g., venture capital or loans, for funding their working capital requirements. In most software firms, the preferred mode of operational funding is retaining earnings and investing them into the business, as per the studies. This dependence on internal sources is so strong that cash management becomes critical. Software companies should not over-leverage their assets by investing in too many areas of opportunity without first reasonably preparing themselves in terms of arrangements to stay liquid and continue operating their companies. Revenue growth is given below:

$$\text{Revenue Growth} = \left(\frac{R_{current} - R_{previous}}{R_{previous}}\right) \times 100 \qquad (4)$$

Where: $R_{current}$ = Revenue in the current period, $R_{previous}$ = Revenue in the previous period.

Table 2: Analysis of financial efficiency factors reporting information regarding the companies' financial performance

Criterion	Company A	Company B	Company C	Company D	Company E	Company F	Company G
Liquidity Ratio	1.2	1.4	1.1	1.5	1.3	1.2	1.4
Days Sales Outstanding (DSO)	30	45	60	50	35	40	38
Revenue per Employee ($000)	250	275	220	240	280	230	260
Cash Flow from Operations ($000)	500	600	450	700	550	650	600
Capital Expenditure ($000)	100	120	80	150	110	95	130
EBITDA Margin (%)	18	20	15	22	19	17	21
Debt to Equity Ratio	0.3	0.2	0.4	0.3	0.25	0.35	0.3

Table 2 analyses financial efficiency factors, which report information regarding the companies' financial performance and productivity level overall. The Liquidity Ratio indicates the capability of the company to meet short-term obligations. Company G and Company B are in the lead with 1.4, which indicates sufficient liquidity, and Company C is trailing at 1.1, which indicates prospective liquidity problems. Days Sales Outstanding (DSO) indicates how quickly a company can bring money back from customers. Company A has the lowest DSO of 30 days, indicating quicker collection, while Company C has the highest DSO of 60 days, indicating slower payment processing. Revenue per Employee ($000) is another operational efficiency measure, and Company E has the best Revenue per Employee with $280,000, meaning efficient utilisation of human resources.

At the same time, Company C shows the worst rate of $220,000. Cash Flow from Operations ($000) is a reflection of cash flow from core operations, and Company D has the best with $700,000, reflecting excellent operations. Capital Expenditure ($000) is an indicator of fixed asset investment. Company D has the best with $150,000 in capital expenditure, reflective of a high-level commitment to long-term asset build-up, followed by the worst with Company C at $80,000. The EBITDA Margin (%) illustrates the profitability ratio, where Company D takes the lead again at 22%, indicating effective cost control, and Company C has the lowest at 15%. Lastly, the Debt to Equity Ratio indicates the leveraged capital of the firm, where Company B is most conservative at 0.2, and Company C is at the highest of 0.4, indicating greater financial risk. All these ratios collectively help in quantifying the financial efficiency and solvency of the companies. EBITDA Margin is:

$$\text{EBITDA Margin} = \left(\frac{EBITDA}{R}\right) \times 100 \qquad (5)$$

Where: EBITDA =Earnings before interest, Taxes, Depreciation, and Amortisation, R =Revenue.

Figure 3 shows economic efficiency indicators, a mixed bar-line graph to facilitate comparison. The bar chart shows Revenue per Employee ($000) and Cash Flow from Operations ($000), while the line chart (on a secondary axis) shows the Liquidity Ratio. Company E demonstrates the highest Revenue per Employee of $280,000, indicating higher productivity, and Company D demonstrates the highest Cash Flow from Operations of $700,000, indicating higher operational efficiency. The Liquidity Ratio line indicates that Company D has the highest liquidity of 1.5, indicating higher financial stability. Company C, on the other hand, demonstrates the lowest Revenue per Employee of $220,000 and the lowest liquidity ratio (1.1), indicating possible

exposures in finance. The two-axis illustration better captures the interaction between liquidity and financial effectiveness and describes more colorfully how Revenue, cash flow, and liquidity cross-react across companies.

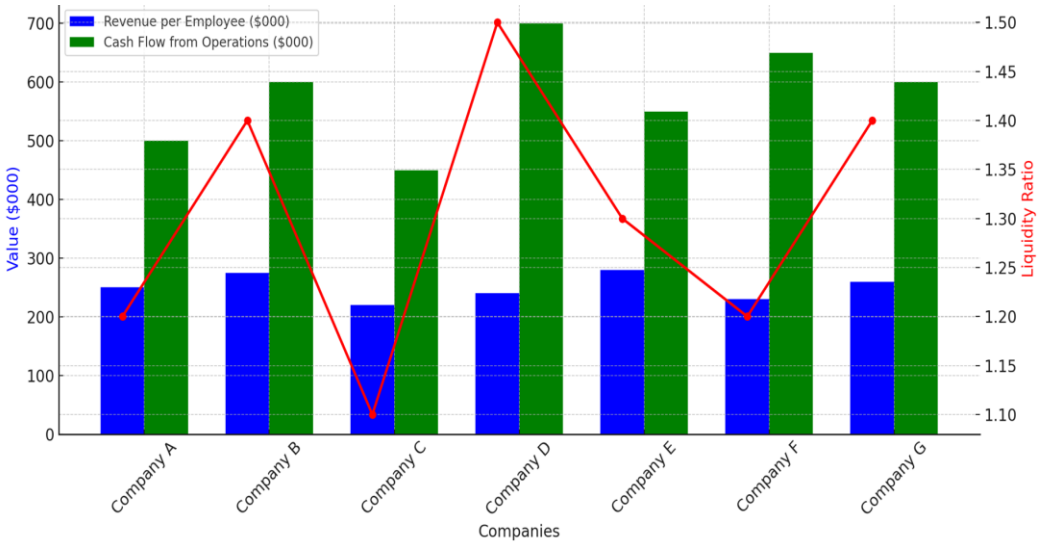

Figure 3: Economic efficiency indicators comparison

Although effective working capital management is a concern for all, including this business, the study reaffirmed that software companies have a particularly specialised concern in this context, characterised by rapid technology upgrades and frequent demands for innovation. The industry companies have no choice but to balance their cost of running a business against their investment requirement in technology and R&D. Unless they have a sound working capital foundation, these firms can be placed at a competitive disadvantage by their inability to fund new ventures or maintain the pace of technological progress. Another important observation the study made is that software firms are poorly studied based on their working capital practice. Despite the explosion in WCM recognition as a high-impact driver of performance, the study argues that few studies address the specific needs of software firms in such circumstances. Such a literature gap can be equated with the fact that a lot remains to be learn about how the working capital practices of software firms can be maximised.

For instance, while the overall manufacturing companies themselves may not be facing such inventory problems, they may also be facing huge pressure to enhance cash and receivables. The study shows that software companies that have a good relationship with the buyers, i.e., receiving improved payment terms, and with the suppliers, through rapid collection, will most likely reap the benefits of higher profitability and financial performance. This capability of handling both receivables and payables effectively achieves a balance whereby the business is given adequate liquidity without putting itself at risk of financial stress in the process. This facet of working capital management is particularly critical in the software business, given the highly competitive market conditions and the ongoing need for businesses to reinvest in new ventures.

The research also explains how working capital management affects the resilience of software companies, especially in times of financial crises. Companies with balanced working capital, characterised by good payables, receivables, and cash positions, are best positioned to handle market uncertainty and maintain business continuity. The study reveals that improperly managed working capital in businesses leads to additional disruptions in the event of cash flow problems or environmental changes, and consequently affects their competitiveness and growth. Committed to these, the study emphasises the importance of considering the broader financial context in which software companies operate. Greater market complexity and volatility resulting from shifting economic circumstances and shifts in technology lend multiple layers of complexity to working capital management for software companies. Uncovering is thus recommended in the research to identify how evolving dynamics of the software sector—i.e., subscription models embracing SaaS (Software as a Service), and greater focus on cloud technology—are being mapped into working capital management.

These new paradigms present both challenges and opportunities in working capital management, with increased requirements for more customised solutions to maximise profitability and liquidity. The research also shows that the majority of research studies carried out in WCM are for traditional industries, and the software industry is a virgin area, especially when it comes to the explicit monetary approaches that need to be adopted by firms in this sector. Lastly, the research presents clear evidence that effective working capital management is a measure of financial success for software firms. Sufficient cash flow, liquidity,

and accounts receivable control sustain software firms, allowing them to invest in growth and keep them going despite shifts in market forces. The results provide evidence that there is unlimited potential for future research on how to ensure the profitability of working capital operations of software firms and sustain business growth in an increasingly competitive and unpredictable business environment.

5. Findings and Suggestions

The performance of software companies has been reasonable in terms of year-to-year growth, i.e., management of working capital, operational expenditure, and general financial health. Working capital of software companies has grown year after year, showing good financial stability and health. This positive working capital indicates that these companies have effectively managed their short-term assets and liabilities, ensuring sufficient liquidity to meet their operating needs. Year-over-year positive working capital has allowed such firms to invest in growth prospects, pay off their short-term commitments, and yet stay profitable. In addition, the consistent increase in working capital has been supplemented by increases in year-round profits, which reflect sound utilisation of resources and sound financial management.

Computer companies have reported good liquidity control with the preservation of a conservative level of current assets, and therefore, the extent of ease with which the short-term commitments can be fulfilled. This is evidence that the firms are well capitalised to absorb any unforeseen expenditure or fluctuations in the market. The firms' cash cushion ensures that there is provision for carrying on with business and reduces the need for external financing. Besides, the low inventory turnover ratio in 2016-2017 provided evidence of inefficiency in the handling of inventories. However, there was a significant improvement in 2017-2018, as the inventory turnover ratio increased by 7.34 times from the previous year. This significant rise indicates that firms have enhanced their efficiency in selling their inventory and generating Revenue. The ratio continued to rise in later years until 2020-2021, when it stood at 7.11 times, indicating overall improvement in inventory management practice, even though the software companies have no or negligible physical inventory.

The debtor's turnover ratio also followed the same pattern. The ratio was also very low for the year 2016-2017, indicating tardy realisation of receivables and probably inefficiency in credit management. In 2017-2018, the ratio was 9.14 times greater than the previous year's same period, showing improvement in credit collection procedures and good financial prudence. In 2019-2021, the debtors' turnover ratio was even greater at 18.01 times, indicating that companies made a substantial and successful effort to collect and shorten the time to convert credit sales to cash. This is due to the better management of cash flow and lower bad debt risk. The creditors' turnover ratio, which indicates the rate at which companies pay their suppliers, also showed the same increasing trend. It was very low in 2016-2017, indicating delayed payment to the suppliers. But the ratio increased to 10.51 times in 2017-2018, indicating better payment efficiency and better supplier relations. The ratio had risen to 11.34 times by 2020-2021, indicating a timely and normal payment practice. The direction of a higher ratio indicates that the companies have kept their accounts payable in good order, showing proper cash management of funds and sound relations with the suppliers.

Working capital turnover ratio, indicating the level to which the companies have been converting working capital into sales, varied slightly in the last two or three years. It was very high during 2016-2017, indicating strong revenue generation based on the strength of working capital. It gradually reduced to 7.45 times during 2017-2018 and further to 6.66 times during 2020-2021, averaging 6.8 times. While the ratio had reduced slightly, it was still an excellent percentage, which indicates that the firms were utilising their working capital to the optimum to bring in revenues. The fact that the ratio did not change indicates a healthy financial status and consistent growth. A cash conversion cycle analysis revealed that computer software firms maintained a cash conversion period of 35 days, which was extremely efficient. It reflects that, on average, companies take 35 days to recover the cash from their investment in inventory and receivables, which gives them a good cash flow and sound financial health. A short and consistent operating cycle is desirable because it reflects sound working capital management and quick turnover of assets into cash.

To continue improving their bottom line, software companies must maintain healthy working capital growth and have sustainable profit margins. As profitability has increased linearly in consonance with working capital, companies must do the same to uphold long-term financial health. Using their strong position of liquidity, companies can strategically invest in avenues of growth, reduce the requirement for external capital, and create a tight hold in the marketplace. With sufficient working capital, companies can strive to put their short-term assets to fullest utilisation so they can maximise turnaround and operating effectiveness. Maximum use of working assets will allow companies to generate maximum returns and minimise the risk of liquidity issues. A balanced ratio of current assets and liabilities will also allow companies to enhance the health and operation of their finances. To enhance the management of receivables, companies should implement effective collection policies, reducing outstanding dues and minimising the risk of bad debts. Proper collection of receivables will enhance the cash position and reduce the utilisation of external funds. In addition, by implementing effective debtor management methods, the companies can reduce the average collection period, thus enhancing their liquidity.

Since the operating cycle was stabilised in 2016-2017, the companies will have to ensure they monitor sustaining this efficiency. Continuous monitoring and tuning of the operating cycle will help the companies sustain effective cash flow management and prevent unnecessary delay in converting assets to cash. To augment the control of inventories, companies may employ a just-in-time system through which raw materials and parts are acquired when they are needed. The strategy will save costs on inventory holding, minimise waste, and free funds for investment elsewhere in the company. Efficient stock level management enables companies to enhance liquidity and invest in income-generating activities. Finally, companies must exercise utmost care in debt management, making timely payments to creditors and collecting from debtors effectively.

Maintaining accounts payable and receivable in harmony will enable the companies to maximise their cash flow, reduce their finance risks to a minimum, and attain improved overall financial well-being. The timely payment to suppliers can even result in better credit terms and concessions, and ultimately make the financial health of the companies certain. In addition, software companies have demonstrated healthy finances and stability in recent years, supported by wise management of working capital, improved turnover ratios, and wise cash flow management. With even more conservative financial behaviour, maintaining healthy balances of payables and receivables, and optimising their operating cycles, such companies can sustain long-term profitability, financial power, and durable growth.

6. Conclusion

Overall, the financial position of software firms is healthy, reflecting prudent management and efficient working capital management. Firms have increased their working capital over the years, which reflects their capacity to sustain liquidity and short-term finance. The recent improvement in inventory turnover is a very strong positive sign, reflecting that the firms are gradually becoming more efficient in managing inventory. The improvement also hints at better operations management, which helps in keeping the bottom line healthier. The company's liquidity is also commendable as it has been able to sustain a decent amount of current assets to finance daily transactions without overextending its resources. Whereas in investment in working capital, the company has invested enough money judiciously so that it has been able to make every day's transaction comfortably without holding too much money unnecessarily.

However, the firm must be watchful and not always invest too much money into working assets, as this can stifle funds that would be more effectively employed in other ventures, such as expansion plans, R&D, or capital building. Maintaining current assets in good order for short-run operating requirements, but not to excess, is the principle of making finances responsive and preventing inefficiency. Overall, the company is healthy with proper management controls in place to maintain its financial equilibrium intact. Focusing on liquidity preservation, working capital, and resource utilisation is helping the company to continue expanding. As long as the company maintains a healthy working capital, manages its payables and receivables effectively, and avoids unnecessary investments in current assets, it will be well-positioned to achieve long-term profitability and future growth in the competitive software market.

6.1. Limitations

The study's limitations in working capital management for software firms are primarily due to its scope-restricted focus on a fixed target sector of companies, which may not accurately reflect the full extent and diversity of practices within the broader software sector. The research relied heavily on publicly listed financial information, which may not accurately represent the specific financial dynamics of private or smaller software firms that do not disclose all relevant financial information. The research also used largely conventional financial measures and ratios that are unlikely to reflect changing business models, novel financial practices, or the operating intricacy of current software firms, especially those embracing subscription-based business models or cloud computing. The limitation is that no qualitative data, including firm culture, external market conditions, and management decision-making, affecting working capital planning, have been used.

6.2. Future Scope

Subsequent research should expand the sample size to cover a broader population of software companies to generalise the results. The use of qualitative research, like management interviews, case studies, or surveys, would yield more in-depth findings on the determinants of working capital management for this sector. Further research can also explore how emerging financial technology and tools, such as artificial intelligence in cash management or blockchain technology for payments, are impacting software firms to learn more about how firms manage such technologies. Analysing the long-term effects of various work capital strategies on profitability and growth, particularly international expansion, can be enlightening. Lastly, studies on the impact of external market conditions, i.e., recession and regulatory shifts, on the working capital management of software firms would be a worthwhile research area in the future.

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