# THE MEDIATING IMPACT OF ACTIVITY-BASED MANAGEMENT (ABM), INTELLECTUAL CAPITAL ON THE EFFECT OF ACCOUNTING INFORMATION SYSTEMS (AIS) ON NON-FINANCIAL PERFORMANCE OF SMES

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**Abstract** - Current study aimed at highlighting the mediating effect of intellectual capital and activity-based management on the relationship between accounting information system and non-financial performance.Quantitativeapproach was adopted in order to reach results of study; an online questionnaire was distributed on (389) employees within (43) SMEs in Jordan during the fiscal year 2022-2023. AMOS and SPSS were employed in order to go through primary data.Results of study indicated AIS has the ability to influence intellectual capital, activity-based management and non-financial performance, this hypothesis was accepted because intellectual capital and activity-based management influences non-financial performance. This led to the final result which indicated that intellectual capital and activity-based management mediate relationship between AIS and non-financial performance. However, study recommended the need to update the management information system used within the framework of technological development, and attention to the quality of accounting information used in evaluating the performance of the institution.

**Keywords** - Activity-Based Management, Cost-Based Management, Accounting Information System, Intellectual Resources, Non-Financial Performance, Customer Loyalty, Re-Engineering, SMEs

## Introduction

The organization is an interconnected object, sections and branches, and it is not possible to separate the internal processes from the external and their results, no matter how much the administration tries to do so. And the idea that the focus is on financial measures of the level of performance and neglect of non-financial measures is wrong, because financial and non-financial performance unite with each other and bring the organization to a stage of performance excellence at all levels [8]; [9].

With the development of information technology in all its forms, organizations have become more oriented towards simplifying accounting operations by relying on computerized programs and systems in order to ensure a high level of accuracy and ease of access, and thus rationalizing financial and investment decision-making, which would positively affect the performance of other aspects like financial position of the organization, including its reputation, customer satisfaction and loyalty, productivity and performance in [1].

[25] believed that in order to raise the level of performance of organizations in all their forms, there is a great need to focus on the indicators of financial and non-financial performance combined, and not to pay attention to one at the expense of the other, as these indicators have the ability to link between the internal and external environment of the organization and thus Evaluate the effectiveness of operational processes and indicate their impact on various levels in the organization. As for [43], he pointed out the importance of non-financial indicators in judging the efficiency of the internal and external operations of the organization along with the financial indicators that would give a clearer picture of the organization and evaluate its performance in general and comprehensively, and it is sufficient to reach a state of complete knowledge of the places Weakness and strength, and therefore the required improvements and developments.

Accounting information and data are very important to the extent that administrators and investors are very interested in it, as it helps to indicate the level of organizational performance in financial terms based on the accuracy and reliability of the incoming accounting information [30]. Therefore,[48] considered AIS as the first and main driver of accounting information control and attention to its quality and accuracy, in order to reach high quality accounting information.

According to the American management scholar Peter Drucker "what can't be measured can't be managed"[50]. [5]and [6]argued that performance measurement is concerned with collecting, analyzing, and communicating results related to the performance of an individual, group, organization, or system. Performance measurement processes are not a new concept in business. Rather, measurement processes and building indicators are among the oldest activities that humans practiced to know the results of their work and correct the course of action. However, building indicators and measuring performance are knowledge that is constantly evolving with the development of human life[35].

In general, the current study claims that AIS positively affects the intellectual capital on the one hand, and on the other hand, AIS also affects ABM, this effect on both variables may be the reason for a positive effect by AIS on non-financial performance measures. In other words, the current study aims to determine the mediating role of ABM and intellectual capital in the relationship between AIS and non-financial performance measures in small and medium organizations.

## II. RESEARCH FRAMEWORK

### 2.1. Accounting Information System AIS

As a result of the economic blocs that exist in the world, and as a natural reaction to the increase in international trade and the huge investments that exist in the world now, and the work of organizations in an unstable business environment, the importance of accounting information systems has emerged as a way to organize the financial matters of the organization in an accurate and fast way and far from human errors [46]; [39]. The finance or accounting department in any organization is the structure or the most important unit in it, as it is concerned with the implementation of accounting work, the completion of financial cycles, and the statement of the financial position of the organization based on the books, records, procedures and various financial arrangements.

AIS is defined as a group of systems concerned with providing digital financial reports that support the decision-making process in the organization. As for [15] it was defined as applications and systems authorized to provide statistical financial reports to decision makers, and these reports are processed and based on accurate data related to financial transactions in the organization. As for [45] AIS has been defined as a sub-system of information within the organization consisting of a set of automated and human capabilities responsible for providing information obtained from the operation of historical data in order to assist management and other external groups in the planning, control and decision-making process. [19] indicated that the importance, size and complexity of AIS varies from one organization to another according to its size, capital, nature of expenses and business activity.

**Elements of AIS**

The principle of AIS is based on the interdependence of human and material elements in order to inventory, operate and compile financial data related to economic activities in the organization and aims to assist in the decision-making process [27], and accordingly, these elements include the following[22] and [31]:

- **Human capital**

It refers to the total accounting competencies that can absorb and deal with the financial operations of the organization in a sound professional manner

- **Material resources**

It includes accounting tools such as computers and their technological accessories such as input and output devices and storage devices

- **Financial data**

It is the financial and accounting data that are based on a tight documentary cycle in order to be counted and recorded on the system based on the control and verification procedures.

### 2.2. Non-Financial Performance

[36] indicates that performance measurement is no longer linked to financial and quantitative criteria that reflect the success of the organization, as numerical reports related to the financial performance of the organization express its performance in a digital image, and in order to measure performance in a better way, it is necessary to look at other performance measures as well that are non-financial information that would provide more comprehensive and clear information about the organization, its level of performance and its competitive advantage[3].

[18] and [40] define non-financial performance measures as the strategic control tools that were created in order to direct the internal operations of the organization, and it includes various measures, some of which are quantitative, such as production management, and other qualitative measures such as product reputation, customer satisfaction, flexibility of manufacturing operations and many others.

### 2.3. Intellectual Capital

Intellectual capital is one of the most important elements in an organization and one of the most influential elements on the organization's growth, market share and reputation significantly [7]. [51] Intellectual capital is defined as the sum of talents, skills, human and intellectual relationships present in the organization that can be used in order to create wealth in the organization. As for [47], they viewed intellectual capital as everything that the individuals working in the organization know that would achieve a competitive advantage, such as previous experiences, current knowledge, relationships, talents and abilities.

And about the difference between intellectual capital and physical capital, [37] indicated that physical capital is the sum of the resources in the organization that appear in its budget, such as real estate, equipment, inventory, movable funds and many others. As for intellectual capital, it is the human element working in the organization, which leads the physical capital and exploits it in order to reach the

best results that are ultimately in the interest of the organization[27].

**Type of Intellectual Capital**

[23] and [49] presented types of intellectual capital, which included the following:

- **Human capital**

It is the experiences, talents, relationships and capabilities of working individuals who are able to provide solutions to customers through innovation and renewal, in addition to the mental abilities of working individuals that enable them to improve and develop.

- **Structural capital**

Infrastructure that supports human capital, such as the technologies used; access to required tools, devices and equipment, information bases, and culture, which have a major role in shaping human capital.

- **Clients' capital**

And it refers to the organizational relationships with the clients who have a working relationship with the organization. Client capital is one of the most important types of intellectual capital because by its nature it sets the principle for the actual organizational work, and it is the first and last reason that drives the organization to be effective and tries to organize, improve and develop its operations Indoor and outdoor.

**Importance of Intellectual Capital**

According to [41]Intellectual capital represents the creative and innovative knowledge and ideas owned by the organization, which contributes to its survival and growth. Therefore, the organization realized that the true value of it grows in the distinguished intellectual capital it possesses that is able to provide opinions and ideas that improve performance and develop the products and services it provides to customers, which ultimately contribute to increasing the competitiveness of the organization.

If the organization fails to manage its financial assets, it can be remedied through the financial restructuring of the organization and the achievement of financial reform, despite the negative results that it generates, but it can be compensated in the short term, but the matter for intellectual capital is considered an intangible asset Which represents the basis and the nerve affecting the exploitation of all other tangible assets and any defect in the management of intellectual capital, it is reflected in the result on the management of other assets[14].

**2.4. Activity-Based Management ABM**

ABM is defined as an integrated approach that refers to management decisions based on information derived from cost management by activity and aimed at satisfying customers and improving profitability, and ABM includes multiple aspects such as pricing, cost reduction, process improvement, and product re-engineering decisions [2].

[38] believes that effective cost management involves the use of a set of methods and tools that will achieve the desired; one of these tools is ABM, which refers to the state of cost management through the management of activities that help the emergence of this cost.

[42] confirmed that ABM relies on many internal analyzes of the organization’s activities, which in combination help to identify areas of cost reduction, that is, ABC determines costs, followed by ABM in order to determine the activities related to these costs and thus control, ration and reduce them from without compromising the quality.

Activity-based management has brought about significant and fundamental changes to organizational activities in terms of activity and cost management [29]; ABM began as one of the administrative matters that are applied at the level of industrial organizations, but it quickly spread to all levels of the same management philosophy and thinking, such as service organizations, government agencies, and even purely administrative and marketing organizations [16].

Over time, the term evolved from activity based management to activity based cost management, which led to cost control by directing the organization's costs and internal operations to a philosophy of benefit and improvement [10].

**Stages of ABM**

In general, the principle of ABM does not depend on following specific stages, but rather it is a method that is chosen by management in order to reach the desired results and apply them at the level of the organization. [24] referred to the same idea, stressing that ABM is based on the principle of providing accurate and up-to-date management reports. And its diversity, in addition to the product mix, flexibility, modification, improvement and development.

Here,[13] refers to the idea of improvement and development that ABM adopts, as it greatly helps to reach a stage where making a decision to improve or develop in a specific area is possible and based on a set of clear and precise inputs, thus allowing the development and improvement of the aspect or several aspects of the organization.

**Difference between ABM and ABC**

The idea of cost-based management existed before activity-based management, and from this ABM was launched considering that it contributed to improving

decision-making and thus improving profitability based on a comprehensive understanding of business operations and thus improving decision-making at the operational and strategic levels[33].

In general, the ABC is the same as the ABM in the following cases[17]:

- Reaching the stage of providing services and products that exceed customer expectations coupled with high profitability
- Carrying out continuous improvements (re-engineering) in terms of quality and efficiency
- Monitoring, directing and rationalizing investment decisions
- Monitoring and directing the product mix
- Selecting and comparing suppliers and negotiating prices for the required resources
- Increasing the quality of services and products in terms of manufacturing, delivery, delivery and customer service
- Effectively targeting the required markets

And to illustrate the idea in a more appropriate way, the researcher found the table below, which shows the differences between ABC and ABM:

| ABM | ABC |
|---|---|
| Focuses on decreasing costs | Focuses on distributing costs |
| Decrease costs without effecting quality | Measure costs based on activities needed |
| Focus on costs that provides the best performance | Focus on costs that sticks into the given budget |
| Measure the budget horizontally based on financial transactions | Measure costs vertically based on source of cost |
| Measure the cost in order to improve pricing | Measure the cost based on consuming |

**Table 1. Difference between ABM and ABC** * Researcher

### 2.5. Hypotheses Development

AIS is an accounting system that provides vital and effective information that serves in the areas of guidance, planning and decision-making in the financial and accounting activities of the organization [4]. Therefore, it is illiterate in a way that contributes to rationalizing investment decision-making in all its forms. In their study, the researchers aimed to find out the importance of AIS and its impact on the profitability of Jordanian banks through a quantitative approach and application (with a questionnaire) on a sample of (206) employees. And based on the results obtained, the study indicated that the adoption of AIS in the financial and accounting operations of banks had a significant impact on the profitability of these banks by maximizing profitability related to performance, quality, reputation of the organization and customer service.

[52] in their study aimed at examining the influence of adopting AIS on effective and efficiency of tasks held by employees within the organization. In general, the researchers aimed to study the mechanism of the impact of the use of AIS on the efficiency of performing the tasks of users of the systems, which are measures in order to determine the extent of the success of the organization and its internal operations. Relying on the quantitative approach and distributing questionnaires to a sample of public sector employees in Malaysian organizations, the study came to the conclusion that the effective system helps users and provides them with support while performing their tasks in an efficient, accurate and error-free manner; where the AIS helps to support the intellectual capital by collecting, storing, classifying, auditing, publishing and facilitating reference to it.

[11] carried out a study that aimed at determining the impact of adopting AIS applications on non-financial performance in small and medium enterprises.Using the quantitative approach, a questionnaire was distributed to managers and leaders in 20 small and medium enterprises in Jakarta. According to the analysis, the results of the study proved that AIS significantly affects the non-financial performance of organizations, specifically with regard to the level of AIS applications used, the extent of commitment of individuals working with them and the extent of technological development in the organization.

A study by [23] aimed to show the mediating effect of human capital, AIS, internal processes and customer performance on the relationship between the organization's strategies and its financial performance. By following the descriptive approach and a case study on a sample of medium and large organizations, the results of the study concluded that the innovation and creativity of the intellectual capital have a significant impact on the financial performance of the organizations, especially if the organization follows a reliable AIS and good and strong customer relations.

In a study by [28], researchers aimed to show whether there is an impact of AIS on the financial and non-financial measures of organizations in Nigeria. And by relying on the quantitative approach, data were collected from 16 organizations operating in Nigeria based on a questionnaire designed by researchers. The results of the study proved that AIS has a significant impact on financial and non-financial performance measures in the Nigerian organizations under study. Weaknesses, which led to the

improvement and development of non-financial performance measures, and thus the effect was proven.In general, the study found that the impact of AIS is not limited to financial performance measures only, but the non-financial performance measures have been affected in terms of credibility, fairness and clarification of areas in which the organization needs to develop and improve in performance.

**Model and Hypotheses**

Based on above argument and building of hypothesized claims; researcher has built a relational model that highlight the nature of interconnectedness between variables of study as following:

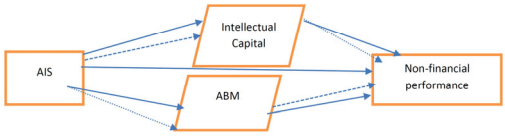



**Figure 1. Study Model** [11]; [12]; [20]

From above model, following set of hypotheses appeared:

H1:Accounting information systems influences intellectual capital

H2:Accounting information systems influences activity-based management

H3:Accounting information systems influences non-financial performance

H4:Intellectual capital influences non-financial performance

H5:Activity-based management influences non-financial performance

H6:There is an influence of accounting information systems through (intellectual capital and activity-based management) on non-financial performance

## III. RESEARCH METHODS

Reaching the main objective of the current study was done by relying on the quantitative methodology that contributed to the provision of digital information, and through the analysis, digital results that can be translated into readable results that would indicate the extent of the research's ability to reach the desired goals. It is worth noting that the current study aimed to show the mediating effect of ABM and Intellectual capital on the relationship between AIS and the non-financial performance of small and medium organizations.

Accordingly, the quantitative approach was adopted in the current study by distributing an electronic questionnaire on Google Forms. The questionnaire consisted of two main parts, the first being the demographic information related to the sample members, while the second part dealt with items related to the study variables (AIS, ABM, Intellectual Capital and Non-financial Performance) based on the five-point Likert scale.

The study population is represented by employees working in Jordanian SMEs during the period (2019) to (2020). A convenient sample of (500) employees within accounting and finances was selected to represent the study population. After the application process, (389) questionnaire were correctly filled out and analyzable questionnaire was obtained, which indicated that the response rate was (77.8%), considering that it is a statistically acceptable percentage.

SPSS was adopted to deal with the collected data and the following statistical methods were used:

- Mean and standard deviation
- Frequency and percentages
- Path Analysis

In order to test the consistency of the scale, Cronbach alpha is used and it is found that alpha = 0.941, which is good because it is greater than 0.60 [21]

## IV. FINDINGS AND DISCUSSION

Respondents within study answered the questionnaire based on likert 5-point scale. When analyzing results of sample responding to questionnaire; it was found that 83% of total sample were males who were within age range of 28-33 years old forming 41.9%. As for academic qualification, it was seen through analysis that 41.1% held a BA degree and 39.3% had an experience of 10-12 years in accounting field.

### 4.1. Questionnaire Results

Mean and standard deviation were calculated in order to identify the nature of responses towards items of questionnaire. As in table 3 below, it can be seen that all mean of items scored higher than mean of scale 3.00 which is statistically positive. Going deeper into analysis, one may see that the highest mean was for item articulated "The cost of accounting information system in the company is consistent with the nature and size of the accounting information provided by the system" scoring a mean of 4.17/5.00 compared to the least mean for item articulated "The AIS provides integrated accounting information that will affect the effectiveness of the company" 3.02/5.00 but also positive as it was higher than mean of scale 3.00.

The same process took place on variables of study as mean and standard deviation were calculated in order to identify the difference in responses generally. However, it was seen – as in table 4 – all variables scored higher than mean of scale 3.00 which was statistically positive. The highest variables scored a mean of 3.58/5.00 which was intellectual capital compared to the lowest mean 3.45/5.00 which was scored by accounting information systems.

| | Mean | Std. Deviation |
|---|---|---|
| AIS | 3.4560 | .86452 |
| IC | 3.5815 | 1.05668 |
| ABM | 3.5548 | .80116 |
| NFP | 3.5103 | 1.29949 |

**Table 1. Variable Statistics**

### 4.2. Hypotheses Testing

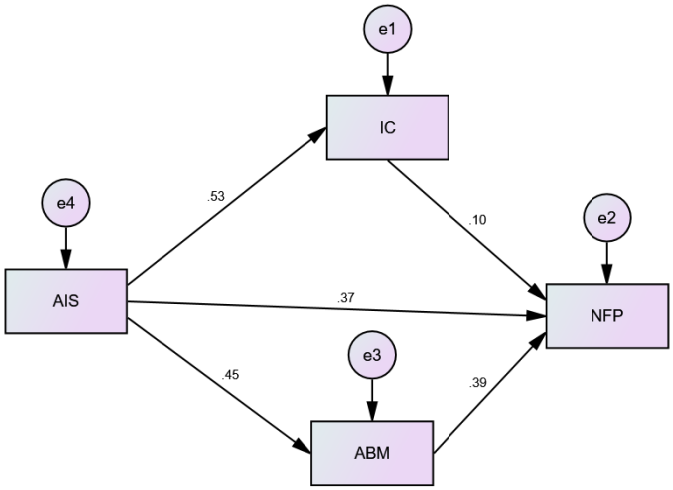
The researcher used Path Analysis test to test the study hypotheses. Following results were found:

| Indicator | AGFI | $\frac{X^2}{df}$ | GFI | RMSEA | CFI | NFI |
|---|---|---|---|---|---|---|
| Value Recommended | > 0.8 | < 5 | > 0.90 | ≤0.10 | > 0.9 | > 0.9 |
| References | [34] | [44] | [34] | [32] | [26] | [26] |
| Value of Model | 0.97 | 2.34 | 0.997 | 0.059 | 0.997 | 0.995 |

**Table 2. Fit model**

Above table shows that above indicators have passed the values recommended by the relevant references; this leads to the hypothesis testing:

| | | | Total effect | Indirect effect | Direct effect | T-value | P | Decision |
|---|---|---|---|---|---|---|---|---|
| IC | <--- | AIS | 0.531 | | 0.531 | 12.354 | *** | accept |
| ABM | <--- | AIS | 0.453 | | 0.453 | 9.998 | *** | accept |
| NFP | <--- | AIS | 0.60 | 0.227 | 0.373 | 7.957 | *** | accept |
| NFP | <--- | IC | 0.099 | | 0.099 | 2.306 | .021 | accept |
| NFP | <--- | ABM | 0.385 | | 0.385 | 9.427 | *** | accept |




Based on above analysis, and launching from hypotheses presented by study earlier, the following was reached:

H1: There is an influence of AIS on IC

Above table shows that (T-value = 12.354; P < 0.05; = 0.000). This means that there is an influence of AIS on IC.

H2: There is an influence of AIS on ABM
Above table shows that (T-value = 9.998; P < 0.05; = 0.000). This means that there is an influence of AIS on ABM

H3: There is an influence of AIS on NFP

Above table shows that (T-value = 7.957; P < 0.05; = 0.000). This means that there is an influence of AIS on NFP

H4: There is an influence of IC on NFP

Above table shows that (T-value = 2.306; P < 0.05; = 0.021). This means that there is an influence of IC on NFP

H5: There is an influence of ABM on NFP

Above table shows that (T-value = 9.427; P < 0.05; = 0.000). This means that there is an influence of ABM on NFP

H6: There is an influence of AIS through (IC and ABM) on NFP

Above table shows that (T-value = 7.957; indirect effect= 0.227; P < 0.05; = 0.000). This means that there is an influence of AIS through (IC and ABM) on NFP.

**4.3. Discussion**

The research came to the conclusion that ABM actually helps to focus on activities rather than costs, that is, it tracks areas and activities from which certain costs can come out and controls, monitors and rations them, and it focuses on overall performance more than individual performance, as the results of ABM appear at the level of the unit or branch and not at the level of individuals. Here - according to what the study has proven - the presence of AIS maximizes the input of the work team and its capabilities to deal with the information in the organization, and proceeds from it to coordinate, arrange and improve decisions taken regarding activities related to certain costs, and thus the organization reaches a stage of increasing efficiency Sub-units and eventually access to the efficiency of the system as a whole.

Accounting Information Systems influences non-financial performance

The study also proved that AIS affects the non-financial performance of the organization, as the latter is characterized by ease of tracking and linking it with organizational strategies, and thus reaching a correct decision. Also, the non-financial performance helps to indicate the level of product quality and the possibility of its decline, such as low customer satisfaction or their loyalty, the organization's market share, or even its reputation. This was agreed on earlier by [4] who argued that AIS does not only affect the financial performance of the organization, but its impact extends to the non-financial performance by focusing on how the organization responds to customer problems and their solution, while financial performance measures cannot detect this problem. Accounting Information Systems influences intellectual capital and activity-based management Study was able to prove the relationship that gathers between accounting information and IC/ABM was influential in its nature. This can be translated into the fact that AIS regulated financial and accounting reports in a way that guarantees to decision makers to reach the best and most accurate decision based on reports that they get. The regulation of accounting information gives decision makers the chance to monitor activities that cost the organization and decide whether to keep them or eliminate them. This was agreed on earlier [52]and[11]arguing that there is a link between non-financial performance and intangible assets in the organization, such as intellectual capital, as it is a non-fixed asset, in addition to the possibility of maintaining customer loyalty, and reducing psychological sensitivity among employees.

The study proved that AIS directly affects the intellectual capital by increasing the organization of the accounting unit employees and increasing their experience through the use of various applications and arranging their work and accounting inputs in a way that ensures the proper flow of business. On the other hand, the study found that AIS also affects the ABM Given that ABM actually keeps track of activities that generate costs, and since AIS provides accurate and thoughtful information about the balance sheet and the authorized spending on it, in this case ABM is able to make a quick decision about the activities that are approved to complete the expenditures against the activities which cannot be sustained due to its high costs.

Intellectual capital and ABM mediate the relationship between AIS and non-financial performance

In the end, the influential relationship from AIS to ABM and the Intellectual capital contributes to regulating the financial matters in the organization, which leaves more room for the authorities concerned with regulating non-financial matters such as customer satisfaction, prices, marketing, storage, reputation and market share. Clear, accurate and vivid financial reports help in supporting decision makers to do the best and what is beneficial for the organization supporting [23]and [28].

## LIMITATIONS OF STUDY AND IMPLICATIONS

Current study is expected to help managers of SMEs to learn how to align AIS application in order to achieve better non-financial performance. However, study was limited to some limitations which appeared as obstacles in delivering more accurate result, such obstacles included:

- Difficulty linking financial and non-financial metrics
- There is no specific standard for measuring non-financial performance, unlike indicators for measuring financial performance
- The absence of a causal link between the non-financial measurement indicators and the level of performance to be achieved, which reduces the objectivity of these indicators

## CONCLUSION AND SUGGESTIONS

In general, the idea of relying on computerized applications in order to ensure the organization of the

sequence of information and maintain a high level of accuracy and quality is a matter that positively affects all units of the organization and not only its financial affairs. As the accuracy and quality of information, whether financial or non-financial, provides individuals working in the organization a clear path to complete the work required of them and motivates them to be creative and innovative and provide their best performance. Reaching this state of organization and logistical support for working individuals, and pushing them to provide their best performance greatly affects the organization and leads it to reach organizational excellence in terms of performance, customer satisfaction, competitive advantage and market share.

Based on above argument of results and analysis, current study recommends the following:

- The need to update the management information system used within the framework of technological development, and attention to the quality of accounting information used in evaluating the performance of the institution

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