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Research Article

Viable System Model (VSM): A New Approach to Accounting Information System Development Model

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Abstract.

This article discusses the potential for using the Viable System Model (VSM) as a new approach in developing accounting information systems. This article takes the form of a systematic literature review. The analysis was carried out using a comparative approach between the System Development Life Cycle (SDLC-Model) and the Viable System Model (VSM) in general and specifically in the field of accounting and accounting information systems. The SDLC is primarily focused on the development and management of software or systems, while the VSM is concerned with the broader understanding and management of complex organizations. Both concepts have their unique applications and are important in their respective domains. The results of the study show that the VSM has a more holistic approach in developing accounting information systems. The research results also show that VSM is more suitable for developing accounting information systems in organizations that are complex, flexible, and adaptive to the speed of change in the company's ongoing organizational business environment. The VSM provides a framework for understanding how organizations and systems can adapt to changing environments and maintain viability. It is particularly useful for complex organizations that need to respond to dynamic conditions.

Keywords: accounting information system development, viable system model, system development life cycle

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1. Introduction

Research on the development of accounting information systems using the system development life cycle (SDLC) approach has been widely carried out and is currently considered the most comprehensive approach. In recent research, dissatisfaction with existing approaches has emerged because several research findings show that this approach has not been able to address system and organizational problems holistically, especially for complex conditions, requiring rapid and sustainable adaptation [1–6] [88].

The need for a more holistic approach to accounting information system development has emerged and several recent studies have begun to try to use alternative approaches, one of which is the Viable System Model (VSM) approach.

The organizational structure of most companies is very much driven by the functions within it. An organization will strive to carry out process improvements aimed at minimizing costs for all individual processes. However, this is a significant error because individual process optimization does not provide optimization for the entire process [84] Currently management is also facing challenges in external and internal relations. This is a consequence of the pressure for decision making in a short time and the lack of coordination between different parts of the organization, lack of adaptability or flexibility. Organizations often fail to view it holistically as agents, interacting and creating cooperative ecosystems. Therefore, the purpose of this study is to propose a holistic approach on how organizations can interact with the environment both internally and externally. The author tries to propose the application of the Viable System Model (VSM) as a tool that can see the organization holistically. VSM is built on three main principles: viability, recursiveness, and autonomy. Survival belongs to any system capable of reacting to internal and external perturbations to maintain a separate existence.

Several previous studies that observed the application of VSM in various sectors included small companies [7–9]. VSM in political systems by [10, 11]. VSM on insurance companies by [12] and in various fields by [13–17] In the hotel sector carried out by [18]. In the financial sector by [19–21]. The application of VSM in project management, information systems and innovation systems has been carried out by many researchers, including by [22–33] [89]. In the field of production, logistics and supply chain by [34–44]. In the health sector, tests were carried out by [45–47]. Research by [48, 49] carried out on the energy sector. [50] made observations on large companies (franchises) and [51, 52] on Start-up companies. Various other sectors such as waste management [53], communities of practices [54], virtual companies [55] and communications media sector [56] have made observations related to VSM applications. In the education sector it has been tested by [57–60]. Application of VSM in social organizations by [61, 62].

Based on the results of previous research and its superior characteristics, VSM has been implemented in various sectors such as: IT, Policy Making, Production, Social Issues, Service Industry, Software Development, etc. Research is carried out by practitioners and researchers [85]. Research on the use of VSM for higher education institutions has also been carried out [86]. The latest research, VSM is able to open up spaces for participation, democracy and accountability in new structures, relationships and social interactions, especially in the era of the Covid 19 pandemic. Current advances in digital technology enable new social relations that need to be developed further, not just the application of technology and methodology. Covid-19 makes it clear that

different local and global interactions are needed to thrive during the pandemic period and opportunities to form new organizations [63].

The empirical and practical implications show that VSM is a very useful tool for organizational project management. VSM knowledge will be of invaluable value to managers who wish to manage organizational projects successfully and survive in a complex and rapidly changing environment. Its application enables the diagnosis and detection of critical factors to achieve such success [87]. The discussion above shows that VSM with its advantages has been proven to be successfully implemented in various areas of the organization in a holistic manner. Implementation can be done in the organization as a whole, units/functions/parts of the organization and existing systems within the organization. VSM is very possible to be implemented in an accounting information system (AIS). The existence of SIA as a provider of information for internal and external parties is becoming increasingly important as today's business organizations are increasingly complex. The development and implementation of an SIA with a holistic approach is certainly relevant for future research [64].

This paper aims to present the concept of a viable system model as a tool that can assist management in managing organizations and systems holistically. In this paper the authors also present a review of the relevant literature in an attempt to demonstrate the strengths of the VSM. Furthermore, the authors discuss the results of previous research by presenting the implementation of VSM in accounting and opportunities for developing VSM in the future. The author also sees the possibility of VSM implementation in accounting information systems.

2. Concept and Literature Review

The System Development Life Cycle (SDLC) and the Viable System Model (VSM) are two distinct concepts used in the fields of systems engineering and organizational management. They serve different purposes, but both are essential in their respective domains.

2.1. System Development Life Cycle (SDLC)

System Development Life Cycle (SDLC): SDLC is a structured approach used in software engineering and systems engineering to design, develop, test, and maintain software or systems. It provides a framework for managing and controlling the entire process of

creating a system or software application. There are various models of SDLC, and the most common ones include: [65–75].

i. Waterfall Model: In this sequential approach, each phase of the project must be completed before the next one begins. It is a linear and highly structured model.

ii. Agile Model: Agile methodologies, such as Scrum and Kanban, emphasize flexibility and iterative development. Teams work collaboratively and adapt to changes throughout the project.

iii. Iterative Model: This model divides the project into smaller cycles or iterations. Each iteration results in a potentially shippable product increment.

iv. Spiral Model: It combines iterative development with elements of the waterfall model. Projects progress through a series of cycles, with each cycle refining the product based on feedback.

v. V-Model: This model aligns testing phases with development phases, ensuring that testing activities are carried out at each stage of development.

The SDLC is crucial for ensuring that software or systems are developed efficiently, meet user requirements, and are maintainable over their lifecycle.

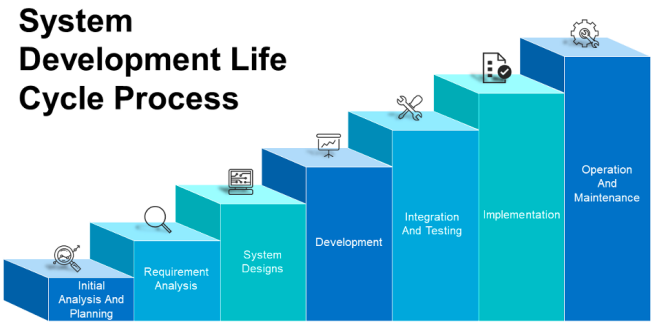

Figure 1: System Development Life Cycle (SDLC).

The System Development Life Cycle is a structured framework used in software engineering and project management to guide the development of software systems or applications. It encompasses the stages and activities involved in building, maintaining, and enhancing software systems. The typical stages in the SDLC include:

i. Planning: Defining the project scope, objectives, budget, and resources required.

ii. Analysis: Gathering and analyzing user requirements and creating system specifications.

iii. Design: Creating a detailed system design, including architecture, user interfaces, and data structures.

iv. Implementation: Writing and coding the software according to the design specifications.

v. Testing: Thoroughly testing the software to identify and fix bugs and ensure it meets the requirements.

vi. Deployment: Installing and deploying the software in a production environment.

vii. Maintenance: Regularly updating and maintaining the software to address issues and add new features.

2.2. Viable System Model (VSM)

The Viable System Model is a framework developed by Stafford Beer to understand and manage complex organizations, often focusing on large, adaptive systems. It is not specific to software or system development but rather to the broader field of organizational management and cybernetics. The VSM is based on the idea that organizations can be seen as systems that consist of interconnected subsystems, each with specific functions [76–83]

Key components of the Viable System Model include:

i. System 1: Operational Units - These are the front-line units responsible for carrying out the organization's primary functions.

ii. System 2: Management - This level is responsible for coordinating and controlling System 1 units.

iii. System 3: Coordination - System 3 ensures that communication and information flow effectively between System 1 and System 2.

iv. System 4: Policy - This level deals with long-term planning, strategy, and policy development.

v. System 5: Intelligence - System 5 collects, analyzes, and disseminates information relevant to the organization's survival and success.

The Viable System Model is a theoretical framework developed by Stafford Beer, a British management cybernetician, to understand and analyze complex organizations and systems. It is primarily used in the field of organizational theory and management. The VSM helps organizations to:

i. Identify Complexity: It assists in breaking down complex organizations into manageable subsystems or units.

ii. Manage Change: VSM helps organizations adapt to changing environments and improve their viability.

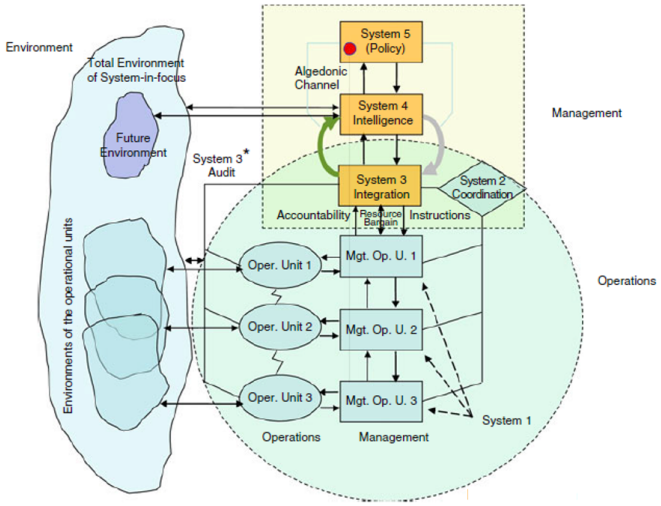

Figure 2: Viable System Model.

iii. Ensure Autonomy: It emphasizes the need for individual units within an organization to have a degree of autonomy while still contributing to the overall goals.

iv. Provide Feedback: VSM encourages feedback loops to ensure that each part of the organization can monitor its performance and adjust as necessary.

v. Clarify Roles: It helps clarify roles and responsibilities within the organization.

The VSM is often represented as a series of nested subsystems, each responsible for specific functions, and interconnected by communication and control mechanisms. In summary, the Viable System Model is a conceptual framework for understanding and managing complex organizations, while the System Development Life Cycle is a structured approach for developing and maintaining software systems. These concepts are used in different domains but can sometimes be combined when organizations seek to develop software systems to support and optimize their internal processes and functions.

3. Discussion

3.1. System Development Life Cycle and Accounting Information System

While academic research specifically focused on the System Development Life Cycle (SDLC) in accounting may not be as common as research in broader areas of information systems or software engineering, there have been studies and research papers over the past decade that address the integration of SDLC principles in accounting information

systems (AIS) or related topics. Below, some general research themes and topics in this area from the last ten years: [1–6]; [88].

i **Implementation of AIS**: Research often explores the development and implementation of AIS, which inherently involves aspects of the SDLC. Topics include the selection of accounting software, customization, and user training.

ii **Integration with Enterprise Systems**: Studies may focus on integrating AIS with broader enterprise systems (ERP systems), examining the challenges and benefits of this integration, and how the SDLC is applied to ensure successful integration.

iii **Agile Methodologies**: Research on the application of Agile methodologies, such as Scrum or Kanban, in the development and maintenance of AIS. This may include studies on Agile's impact on AIS project outcomes.

iv **Compliance and Regulatory Changes**: Investigations into how AIS are developed and updated to comply with changing accounting standards, tax regulations, and financial reporting requirements.

v **Security and Controls**: Research into the development of secure AIS, including how SDLC practices are used to design and implement robust security and internal control measures.

vi **User Requirements and Stakeholder Involvement**: Studies exploring how user requirements are gathered and managed during the SDLC for AIS, as well as the importance of stakeholder involvement.

vii **Cloud-Based Accounting Systems**: Research into the development and adoption of cloud-based AIS, considering the SDLC implications of transitioning from on-premises to cloud-based accounting solutions.

viii **Data Analytics and Business Intelligence**: Investigations into how AIS are developed to support data analytics and business intelligence functions, and the role of the SDLC in creating data-driven accounting systems.

ix **Continuous Improvement and Post-Implementation**: Studies on how AIS are continually improved and updated after the initial implementation, including the use of the SDLC for ongoing enhancements.

Additionally, consider exploring the websites of accounting research organizations and associations like the American Accounting Association (AAA) or the International Federation of Accountants (IFAC) for publications and resources related to AIS development and SDLC in accounting.

3.2. Comparison of System Development Life Cycle (SDLC) and Viable System Model (VSM)

The System Development Life Cycle (SDLC) and the Viable System Model (VSM) are two distinct frameworks used in different domains, and they serve different purposes. Here are the key differences between them:

i **Purpose and Domain:**

a. **SDLC (System Development Life Cycle)**: SDLC is primarily used in the field of software engineering and systems engineering. Its purpose is to guide the development, implementation, and maintenance of software or information systems. SDLC focuses on the technical aspects of building and managing systems.

b. **VSM (Viable System Model)**: VSM is a framework used in organizational management, particularly in the field of cybernetics. It is not specific to software or system development but instead focuses on understanding and managing complex organizations. VSM addresses the organizational and systemic aspects of an entity.

ii **Scope:**

a. **SDLC**: SDLC deals with the entire lifecycle of software or system development, from initial planning and requirements analysis through design, development, testing, deployment, and maintenance.

b. **VSM**: VSM focuses on the structure and dynamics of an organization as a whole. It encompasses various aspects, including organizational hierarchy, communication, coordination, policy formulation, and adaptation to external and internal changes.

iii **Application**:

a. **SDLC**: SDLC is applied primarily to develop and manage software applications and information systems. It provides a structured approach to building technology solutions that meet specific requirements.

b. **VSM**: VSM is applied to understand and optimize complex organizations, helping them adapt to changing environments, improve coordination, and ensure viability. It is more concerned with management and governance than with technical development.

iv **Phases**:

a. **SDLC**: SDLC typically consists of phases like planning, analysis, design, implementation, testing, deployment, and maintenance. It's a linear or iterative process focused on building and delivering a software product.

b. **VSM**: VSM doesn't have specific phases like SDLC. Instead, it identifies key functions or systems (System 1, 2, 3, 4, 5) within an organization and emphasizes their interrelationships and roles in achieving organizational viability.

v **Output**:

a. SDLC: The primary output of SDLC is a functional software application or information system that meets specified requirements.

b. VSM: The output of VSM is an improved understanding of an organization's structure and dynamics, leading to better organizational design, communication, and adaptability.

3.3. Viable System Model and Accounting Information System -- The Steps

Implementing the Viable System Model (VSM) in an accounting information system involves using VSM principles to design, structure, and manage the accounting processes within an organization. The VSM provides a framework for creating a flexible and adaptive accounting system that can respond effectively to changing business environments. Here are the steps to implement VSM in an accounting information system:

i Understand the Viable System Model (VSM): Ensure that the team responsible for the accounting system is familiar with the VSM principles and concepts. This understanding is crucial for effective implementation.

ii Identify System Components: Break down the accounting information system into its components or subsystems. These may include accounts payable, accounts receivable, financial reporting, budgeting, and other relevant functions.

iii Define Roles and Responsibilities: Clearly define the roles and responsibilities of each subsystem within the accounting information system. In VSM, these roles should be designed to ensure autonomy and accountability.

iv Establish Communication Channels: Create effective communication channels between the various subsystems. In VSM, information flows are critical for maintaining the viability of the entire system. Ensure that subsystems can exchange data and feedback efficiently.

v Implement Feedback Loops: Introduce feedback mechanisms within the accounting system to monitor performance and identify issues. For example, implement regular financial audits, variance analysis, and performance reports.

vi Ensure Autonomy: Empower each subsystem with a degree of autonomy to make decisions and manage its own functions. This autonomy should be balanced with alignment with the overall accounting goals.

vii Adapt to Change: Design the accounting system to be adaptable to changes in the business environment. The VSM encourages flexibility and the ability to evolve when necessary.

viii Implement Control Mechanisms: Introduce control mechanisms to ensure compliance with accounting standards, regulatory requirements, and internal policies. These controls should be designed to avoid bottlenecks and allow for efficient operations.

ix Training and Documentation: Train accounting personnel on the new VSM-based processes and provide clear documentation of roles, responsibilities, and procedures.

x Continuous Improvement: Implement a continuous improvement process within the accounting information system. Regularly assess the system's performance, gather feedback, and make necessary adjustments.

xi Monitor Performance: Continuously monitor the performance of the accounting information system and its subsystems. Use key performance indicators (KPIs) to measure effectiveness.

xii Adapt to External Changes: Keep an eye on external factors such as changes in tax laws, accounting regulations, and technology trends. Adapt the accounting system accordingly to remain viable.

xiii Integration with Other Systems: Ensure that the accounting information system is integrated with other relevant systems within the organization, such as Enterprise Resource Planning (ERP) systems.

xiv Risk Management: Implement risk management strategies to identify and mitigate potential risks related to financial reporting and data integrity.

xv Compliance and Reporting: Ensure that the accounting information system generates accurate and timely financial reports for internal and external stakeholders while complying with legal and regulatory requirements.

3.4. Viable System Model and Accounting Information System -- The Synchronize

The Viable System Model (VSM) is a framework primarily used in organizational management and cybernetics to analyze and design adaptable and sustainable organizations. While it's not traditionally applied directly to accounting information systems, you can apply VSM principles to the design and management of accounting information systems (AIS) within an organization to enhance their effectiveness and adaptability. Here's how you can integrate VSM principles into an AIS:

i System 1 - Operational Units:

In the context of AIS, System 1 could represent the day-to-day accounting processes and transactions. These include data entry, accounts receivable, accounts payable, payroll, and financial reporting.

ii System 2 - Management:

System 2 in the AIS context would involve managing and overseeing the operational aspects of accounting. This could include roles responsible for supervising data entry, financial analysis, and compliance.

iii System 3 - Coordination:

Coordination is crucial in AIS. This level ensures that data flows efficiently between different accounting processes. It can involve data integration, reconciliation, and consistency checks to ensure accurate financial reporting.

iv System 4 - Policy:

System 4 in AIS refers to setting accounting policies, standards, and procedures. This level establishes the rules and guidelines for financial reporting, internal controls, and compliance with accounting regulations (e.g., GAAP or IFRS).

v System 5 - Intelligence:

System 5 gathers and analyzes data to provide insights for decision-making. In AIS, this level can include financial analysis, budgeting, forecasting, and data-driven insights for management.

3.5. Viable System Model And Accounting Information System -- Current Practical

Implementing the Viable System Model in accounting requires a holistic approach that considers the entire accounting function and its interaction with other parts of the organization. It can help organizations streamline their financial processes, improve decision-making, and adapt to changing business environments. Here are some practical examples of how VSM principles can be applied in accounting:

i Accounts Payable (AP) Subsystem:

a Identification: Define the AP subsystem responsible for managing vendor invoices and payments.

b Roles and Responsibilities: Clearly define roles within the AP team, such as invoice processing, approval, and payment issuance.

c Feedback Loops: Implement regular reconciliations to ensure accuracy, track payment delays, and gather feedback from vendors.

d Autonomy: Empower the AP team to negotiate payment terms within predefined limits.

e Adaptability: Develop processes to handle varying invoice volumes and payment methods.

f Integration: Integrate the AP subsystem with procurement and budgeting to ensure alignment.

ii Accounts Receivable (AR) Subsystem:

a Identification: Define the AR subsystem responsible for invoicing, customer payments, and credit management.

b Roles and Responsibilities: Clearly define roles for invoicing, collections, and credit control.

c Feedback Loops: Implement regular aging reports and customer feedback mechanisms.

d Autonomy: Allow the AR team to set credit limits and negotiate payment terms.

e Adaptability: Create flexible billing options to accommodate different customer needs.

f Integration: Ensure seamless integration with sales and customer relationship management (CRM) systems.

iii Financial Reporting Subsystem:

i Identification: Define the financial reporting subsystem responsible for producing financial statements.

ii Roles and Responsibilities: Specify roles for financial analysts, reporting specialists, and data integrity managers.

iii Feedback Loops: Conduct regular variance analysis and reviews to ensure data accuracy.

iv Autonomy: Empower financial analysts to make recommendations for improving financial performance.

v Adaptability: Develop dynamic reporting templates to accommodate changing reporting requirements.

vi Integration: Integrate financial reporting with data sources such as ERP systems.

iv Budgeting and Forecasting Subsystem:

i Identification: Define the budgeting and forecasting subsystem responsible for financial planning.

ii Roles and Responsibilities: Clearly outline roles for budget managers, analysts, and reviewers.

iii Feedback Loops: Conduct periodic budget reviews and variance analysis.

iv Autonomy: Allow budget managers to adjust budgets within defined limits.

v Adaptability: Implement rolling forecasts to adapt to changing market conditions.

vi Integration: Integrate budgeting with financial reporting and ERP systems.

v Compliance and Regulatory Reporting Subsystem:

i Identification: Define the subsystem responsible for ensuring compliance with accounting standards and regulations.

ii Roles and Responsibilities: Specify roles for compliance officers, internal auditors, and external reporting specialists.

iii Feedback Loops: Conduct regular compliance audits and assessments.

iv Autonomy: Empower compliance officers to recommend and implement necessary changes.

v Adaptability: Stay updated with changing accounting regulations and adapt reporting accordingly.

vi Integration: Integrate compliance reporting with financial reporting and external audit processes.

3.6. Viable System Model and Accounting Information System -- Benefit

Applying the VSM to AIS can help organizations in the following ways:

i Adaptability: The VSM framework encourages organizations to be adaptable and responsive to changing accounting standards, regulatory requirements, and business needs.

ii Efficiency: By ensuring that information flows efficiently through the AIS and that operational units are well-coordinated, the organization can improve the efficiency of its accounting processes.

iii Resilience: A well-structured AIS based on VSM principles can help organizations withstand external shocks and internal challenges, ensuring the viability of financial reporting.

iv Compliance: The VSM can assist in establishing and enforcing accounting policies and standards to ensure compliance with relevant regulations.

v Data-Driven Decision-Making: System 5 helps in harnessing data for informed decision-making in financial matters.

3.7. Viable System Model and Accounting Information System -- Potential Research Area

The Viable System Model (VSM) is primarily applied to organizational management and cybernetics, focusing on improving the adaptability and effectiveness of complex organizations. While VSM is not commonly associated with accounting information systems

(AIS) in the same way it is with organizational design, it is possible to find research and applications that integrate VSM principles with AIS. Here are some potential areas where VSM principles may be applied in the context of AIS research:

i Organizational Structure and Coordination:

Research could explore how VSM principles can be used to design the organizational structure of accounting departments within larger organizations. This might involve investigating how different accounting functions (e.g., accounts payable, accounts receivable, financial reporting) can be better coordinated using VSM concepts.

ii Adaptation to Regulatory Changes:

Studies could investigate how VSM can help organizations in the financial sector adapt to rapidly changing regulatory requirements. This could include exploring how the VSM framework enables organizations to quickly modify their accounting processes and reporting practices to remain compliant.

iii Data Flow and Integration:

Research could focus on how VSM principles can be applied to optimize data flow within AIS. This might involve examining how VSM can improve the integration of financial data from various sources to support real-time financial reporting and analysis.

iv Risk Management and Resilience:

Studies might explore how VSM can enhance an organization's ability to identify and manage financial risks. This could involve using VSM to design AIS components that provide early warning systems for financial anomalies.

v Decision Support and Strategic Planning:

Research could investigate how VSM principles can be used to improve the decision support capabilities of AIS. This might include developing AIS modules that align with VSM's System 5 (intelligence) to provide executives with better financial insights for strategic planning.

vi Case Studies and Implementations:

Researchers might conduct case studies of organizations that have integrated VSM principles into their AIS. These case studies could provide insights into the practical challenges and benefits of applying VSM in the accounting domain.

vii Measurement and Evaluation:

Research could focus on developing metrics and evaluation criteria to assess the effectiveness of AIS implementations that incorporate VSM principles. This would help quantify the impact of VSM on accounting processes and organizational performance.

viii Organizational Adaptability:

Research may investigate how organizations can use VSM principles to enhance their adaptability in response to changes in accounting standards, regulations, and market conditions. This could involve case studies of organizations that have successfully applied VSM to their accounting departments.

ix Integration of Accounting Functions:

Researchers might explore how VSM can be used to streamline and integrate various accounting functions, such as accounts payable, accounts receivable, and financial reporting, to improve overall coordination and efficiency.

x Financial Risk Management:

Research may focus on how VSM can help organizations identify, assess, and manage financial risks effectively. This could include the development of VSM-based risk management frameworks for accounting departments.

xi Real-time Financial Reporting:

Studies might investigate how VSM principles can be applied to design accounting information systems that support real-time financial reporting and analysis, enabling organizations to make informed decisions promptly.

xii Alignment with Organizational Strategy:

Research could explore how VSM can facilitate the alignment of accounting practices and reporting with broader organizational strategies. This could involve assessing how VSM principles support strategic planning and decision-making within accounting departments.

xiii Evaluation of VSM Implementations:

Researchers might develop evaluation criteria and metrics to assess the impact of VSM implementations in accounting. This would involve measuring improvements in efficiency, accuracy, and adaptability resulting from VSM integration.

xiv VSM Case Studies in Accounting:

Case studies of organizations that have applied VSM principles to their accounting processes can provide valuable insights into the challenges and benefits of this approach. Researchers can analyze these case studies to extract lessons learned and best practices.

xv Change Management and Training:

Research may investigate the role of change management and employee training in successfully implementing VSM in accounting. This includes understanding how to manage the cultural and organizational shifts that may result from VSM integration.

xvi VSM in Auditing and Compliance:

Researchers might explore how VSM principles can be used to enhance auditing processes and ensure compliance with accounting standards and regulations. This could involve the development of VSM-based auditing methodologies.

4. Conclusion and Limitation

In summary, SDLC is a framework used for the development and management of software and information systems, while VSM is a framework used for understanding and managing complex organizations. While both are valuable in their respective contexts, they are fundamentally different in terms of scope, purpose, and application.

Implementing the Viable System Model in an accounting information system is a comprehensive and ongoing process. It requires a commitment to principles of flexibility, adaptability, and effective communication to ensure the viability of the accounting processes within an organization.

Implementing VSM in accounting involves tailoring these principles to the specific needs of the organization, creating clear communication channels, establishing feedback loops, and ensuring that each subsystem functions autonomously while contributing to the overall viability of the accounting function. This approach can lead to a more agile and responsive accounting department capable of meeting the organization's financial goals effectively.

It's important to note that implementing the VSM in an AIS context requires careful planning, as the VSM is typically applied at the organizational level. However, by aligning the principles of the VSM with AIS components and processes, an organization can create a more adaptable, efficient, and resilient accounting information system.

While VSM is not a mainstream framework for AIS, innovative researchers may explore how its principles can be adapted and integrated into the design and management of accounting information systems to enhance organizational viability, adaptability, and overall effectiveness. It's essential to consider that such research would likely be at the intersection of AIS and organizational management.

It's important to note that research at the intersection of VSM and accounting is relatively limited compared to other fields where VSM is more commonly applied. As such, conducting original research in this area could contribute to the development of new insights and practices for integrating VSM principles into accounting processes and systems.

References

[1] Chan YE, Vasarhelyi MA. Innovations in financial statement auditing: Theories and empirical evidence.

[2] Vasarhelyi M, Halper F. The continuous audit of online systems. https://doi.org/10.1108/978-1-78743-413-420181004

[3] Yang L, Xiao JZ. Design and implementation of the financial management information system based on the web services and SOA.

[4] Krishna A V, Whinston AB. Information systems integration and business process performance in financial services.

[5] Romney MB, Steinbart PJ. Accounting. *Inf Syst*. 2018.

[6] Weiger WH, Venczel Z. A model-driven approach to the development of financial information systems.

[7] Espejo R. Information and management: The cybernetics of a small company. *Manage Res News*. 1979;2(4):2–15.

[8] Al-Mutairi SG, Burns ND, Backhouse CJ. CJB. Using a viable system model as a diagnostic tool for small-sized companies. *Int J Serv Oper Manag*. 2005;1(3):220–238.

[9] Chan J. Enhancing organisational resilience: Application of viable system model and MCDA in a small Hong Kong company. *Int J Prod Res*. 2011;49(18):5545–5563.

[10] Beer S. Brain of the firm. 2nd ed. Chichester: John Wiley; 1981.

[11] Willemsen M. Die Schweizerische Eidgenossenschaftalslebensf. Higes System: Kybernetische Analyse Des Schweizerischenpolitischen System. Verlag Rüegger; 1992.

[12] De RJ. The implications of Beer's viable system model for organizational adaptation: A study in an insurance organization. *Gen Syst*. 1987;30:9–13.

[13] Espejo R, Harnden R. The viable system model. Interpretations and applications of Stafford Beer's Vsm. Chichester: John Wiley & Sons; 1989.

[14] Espejo R. The viable system model. *Syst Pract*. 1990;3(3):219–221.

[15] Herold C. Ein Vorgehenskonzeptzur Untemehmensstrukturierung: Eine heuristischeAnwendung des ModellsLebensf.higerSysteme. 1991.

[16] Espejo R, Schwaninger M. Organisational fitness: Corporate effectiveness through management cybernetics. Frankfurt, New York: Campus Verlag; 1993.

[17] Leonard A. The viable system model and its application to complex organizations. *Syst Pract Action Res*. 2009;22(4):223–233.

[18] Schwaninger M, Haff P. CyberSyn. Ein Kybernetisches Management-System. Anwendungsmodell Und Test Forschungsbericht Univ St Gall.

[19] Leimer H. Vernetztesdenkenals Basis Für Der Strategischen. Probleml. Sungs Und Früherkennungsprozess In Banken. Druckerei Wetzel; 1990.

[20] Narvarte P, Castillo C, Torres N. Estudio De La Viabilidadorganizacional Del Sector Cooperativo De Ahorro Y Cr.Ditoen Chile. 1er Coloquiointernacional La Red RULESCOOP.

[21] Trueba B, Badillo I, Morales O. Diagn.stico del sistemafinanciero, la banca comercial y elsistema de portafoliosbasadoenelModelo de SistemasViables. *Cient.fica.* 2012; 16: 55–65.

[22] Britton GA, Parker J. An explanation of the Viable System Model for project management. *Syst Pract*. 1993;1:163–176.

[23] Van Kempen M. ExterneInformationsbeschaffung von Unternehmungenaussystemtheoretischer Sicht. ADAG Administration & Druck AG, St. Gallen; 1991.

[24] PucheRegaliza JC. Quantitative analysis of viable system model on software projects in the ICT sector in Castilla. *Y Le. N Kybernetes*. 2015;44:806–822.

[25] Bathallath S. Smedberg, Kjellin H. Project interdependency management in it/is project portfolios: From a systems perspective. *Procedia Comput Sci*. 2016;100:928–934.

[26] Schuhmann W. Infomations-management: Unternehmensführung Und Informations System Eaussystem Theoretischer Sicht. Frankfurt, New York: Campues Verlag; 1991.

[27] Devine S. The viable systems model applied to a national system of innovation to inform policy development. *Syst Pract Action Res*. 2005;18(5):491–517.

[28] Pa A, Gl A, Mm O, Al E. El Sistema De Innovaci.N Del Departamento Del Atl. Ntico: Unamiradadesde La Cibern.Ticaorganizacional. Gerenciatecnol.Gicainform.Tica. 2006;5:55–62.

[29] Morales-Arroyo M, Chang Y, Barragán-Oca na A, Jiménez J, Sánchez-Guerrero G. Coordination mechanisms illustrated with project management using the Viable System Model (VSM) as organizational framework. *Jindal J Bus Res*. 2012;1(2):163–176.

[30] Murad RS, Cavana RY. Applying the Viable System Model to ICT Project Management. *Int J Appl Syst Stud*. 2012;4(3):186–205.

[31] Preece G, Shaw D, Hayashi H. Using the Viable System Model (VSM) to structure information processing complexity in disaster response. *Eur J Oper Res*. 2013;224(1):209–218.

[32] PucheRegaliza JC. An.lisiscualitativo del Modelo de SistemasViablessobreproyectos Software Del Sector Tic En Castilla Y Le.N. Direcci. *Dir Y Organ*. 2014;52:26–37.

[33] PucheRegaliza JC. Extending The viable system model scope on ICT-sector software projects in Castilla Y. *Le. N Kybernetes*. 2014;43:192–209.

[34] Thiem I. Ein Strukturmodell des Fertigungsmanagements: SoziotechnischeStrukturierung von Fertigungssystemenmit dem Modell Lebensf.higerSysteme. Ruhr Universit.t Bochum, Bochum; 1998.

[35] Contreras A. Metodolog.A De Diagn.Stico Para Sistemaslog.Sticos. Revisa Ean. 1999;38:58–69.

[36] Tavella E, Papadopoulos T. Expert and novice facilitated modelling: A case of a viable system model workshop in a local food network. *J Oper Res Soc*. 2015;66(2):247–264.

[37] Herrmann C, Bergmann L, Halubek P, et al. Lean production system design from the perspective of the viable system model. *Manuf Syst Technol New Front*. Springer; 2008. pp. 309–314.

[38] Chroneer D, Mirijamdotter A. Systems thinking benefits in supply change management: An illustration of the Viable Systems Model in a supply chain. *Int J Intell Syst Technol Appl*. 6.

[39] Badillo I, Tejeda R, Morales O, et al. Supply chain management from a systems science perspective. Supply Chain Manag – New Perspect; Prof. Sand. https://doi.org/10.5772/22229

[40] Azadeh A, Darivandi K, Fathi E. Diagnosing, Simulating and improving business process using cybernetic laws and the Viable System Model: The case of a purchasing process. *Syst Res Behav Sci*. 2012;29(1):66–86.

[41] Brecher C, Müller S, Breitbach T, Lohse W. Viable System Model for manufacturing execution systems. *Procedia CIRP*. 2013;7:461–466.

[42] Hildbrand S, Bodhanya S. The potential value of the Viable System Model as a managerial tool. *Manag Dyn*. 2013;22:2–15.

[43] Ortiz M, Del Valle M. Desarrollo De Un Sistemaautomatizado Para El Control De Existencias Y Reposici.N De Repuestos De Unaempresa De Repuestosautomotriz. *Revistaespacios*. 2014;35:7–21.

[44] Vs V, Groten M. Design and simulation of a logistics distribution network applying the Viable System Model (VSM). *Procedia Manuf*. 2015;3:534–541.

[45] Bachmann M, Michel D. Das Pentagramm Der Komplexit.Tsbew.Ltigung: Management Kybernetik Am Beispiel Des Schweizer Paraplegiker-Zentrumsnottwil. Verlag Paraplegie Schweizer Parapelgiker-Stiftung Basel.

[46] Monreal-.Lvarez M. Aspectoste.Ricos Del Cambio Organizacionalenlos Hospitales. Cuad M. *Dicos Soc*. 2004;44:192–194.

[47] Midgley G. Systemic intervention for public health. *Am J Public Health*. 2006;96(3):466–472.

[48] Dr S. The Viable Systems Model applied to a smart network: The case of the UK electricity market. *J Inf Technol*. 2004;19(4):270–280.

[49] La T, Ca V, Ml M, Al E. Strategies for the distribution of power in Brazil: A proposal from the perspective of the Viable System Model (VSM). *Syst Res Behav Sci*. 2016;33(2):224–234.

[50] Broker JJ. Erfolgreiches Management Komplexerfranchisesysteme Auf Grundlage Des Viable System Model. Diss Hsgdifo-Druck Gmbh Bamb.

[51] Tran CC. Assessing Stafford Beer's Viable System Model (VSM). Development of a measurement framework for an empirical test of the viability hypothesis. In: Conference Paper, 13thworld Congress On Systems And Cybernetics, Maribor, Slovenia, 6-10 July. 2005.

[52] Tran Cic. Beer's Viable System Model Und Die Lebensf.Higkeit Von Jungunternehmen-Eineempirischeuntersuchung. Difo-Druckgmbh, Bamber.

[53] Dodis C, Kitis K, Panagiotakopoulos D. Organizational cybernetics for waste management authorities: A case study. Available In: Http://Www.Bvsde.Paho.Org/Bvsacd/Iswa2005/Case.Pdf

[54] Frost B. Lebensf.higkeit Von Communities of Practice Imorganisationalenkontext. Phd Dissertation, University of Sant Gallen; 2004.

[55] Grizelj F. Kollaborativeswissensmanagement. Virtuellen Dienstsleistungsunternehmen. Bamberg: Difo-Druck Gmbh; 2005.

[56] Türke R. Towards productive and sustainable forms of interaction in governance. *Kybernetes*. 2006;35(1/2):164–181.

[57] Ramirez M. Medina Vh, Fuente D De La. Mejoramiento De Gesti.Nuniversitaria Basadoenel Modelo De Sistemasviables. *Caso Estud Univ Libr Ing*. 2009;14:59–66.

[58] Oliveira J. Modelo De Sistema Viable Comoherramienta De Dise. *Rev Espol*. 2010;23:1–8.

[59] Rojas J, Tuesta J. Estudio De Unaexitosagesti.N De Unainstituci.N De Formaci.Nprofesional Peruana Desdeelenfoque De Sistemas De Stafford Beer. *ECIPER*. 2011;8:180–189.

[60] Fitch D, Parker-Barua L, Watt JW. Envisioning public child welfare agencies as learning organizations: Applying Beer's Viable System Model to title Iv-E program evaluation. *J Public Child Welf*. 2014;8(2):119–142.

[61] Vargas Ji, Alonso I. Metodolog.As Del Pensamientosist.Mico Y Suusoenelan.Lisis De La Viabilidad De Las Organizaciones Rurales En Colombia. Encuentro Colomb Din.Mica Sist; 9.

[62] Espinosa A, Walker J. Complexity management in practice: A Viable System Model intervention in an Irish eco-community. *Eur J Oper Res*. 2013;225(1):118–129.

[63] Espejo R. The Cybernetics of political communications and social transformation in Colombia: The case of the National Audit Office (1995–1998). *AI Soc*. 2022;37(3):1255–1267.

[64] Hakiki A. Viable System Model (VSM): A holistic approach to organizational sustainability. *Int J Manag Stud Soc Sci Res*. 2023:161–170.

[65] Royce WW. Managing the development of large software systems: Concepts and techniques.

[66] Boehm BW. A spiral model of software development and enhancement. https://doi.org/10.1016/B978-0-08-051574-8.50031-5

[67] IEEE Computer Society. Guide to the software engineering body of knowledge (SWEBOK).

[68] Pressman Rs. Software Engineering: A Practitioner's Approach.

[69] Highsmith J. Adaptive software development: A collaborative approach to managing complex systems.

[70] Jacobson I, Christerson M, Jonsson P, et al. Object-oriented software engineering: A use case driven approach.

[71] Davis AM. Software requirements: Objects, functions, and states.

[72] Beck K, Beedle M, Bennekum A Van, et al. Manifesto for agile software development.

[73] Kruchten P. The 4+1 view model of architecture.

[74] Bass L, Clements P, Kazman R. Software architecture in practice.

[75] ISO/IEC/IEEE 12207:2017. Systems and software engineering - Software life cycle processes.

[76] Lopes P, Aparicio M. The Viable System Model in information systems theory: An application in business process management. In: Proceedings of the European Conference on Information Systems (ECIS). 2015.

[77] Read W, Rosemann M, Newton P. Applying the Viable System Model to enterprise systems implementation: A case study in higher education. *Proceedings of the Australasian Conference on Information Systems*. 2010.

[78] Harwood TN. The Viable System Model: An interpretation for information systems. Inf Organ.

[79] Carlile P, Christensen M. Applying the Viable System Model in accounting: A case study. Learn Organ.

[80] Palval A, Brougham D. Developing a viable system model for accounting: A pragmatic constructivist approach. *Australas J Inf Syst*.

[81] Khan A, Spanyi Z. Designing an accounting system for viability: A viable system approach. *Int J Financ Account*.

[82] Skerritt M. A systems approach to accounting and auditing. *J Oper Res Soc*.

[83] Collier Pm, Gregory A. Systems thinking in accounting education. *Issues Account Educ*.

[84] García-García SG. Design and simulation of an integrated model for organisational sustainability applying the Viable System Model and system dynamics; Research area of productive systems at UNED University, Madrid, Spain; © Ifip International Federation For Information Processing 2019 Published By Springer Nature Switzerland AG 2019 F. Ameri et al. (Eds.): APMS 2019, IFIP AICT 567, pp. 555–563, 2019. https://doi.org/10.1007/978-3-030-29996-5_64

[85] Amin Vahidi, Alireza Aliahmadi and Ebrahim Teimoury; Researches Status And Trends Of Management Cybernetics And Viable System Model; Iran University Of Science And Technology, Iust, Tehran, The Islamic Republic Of Iran; Kybernetes © Emerald Publishing Limited 0368 492x Doi https://doi.org/10.1108/K-11-2017-0433

[86] Sahar Saeed Rezk And Shahinaz Gamal; The Viable System Model and its applications in higher education: An overview; Department of Socio-Computing, Faculty of Economics and Political Science, Cairo University, Giza, Egypt; Kybernetes © Emerald Publishing Limited 0368-492x Doi https://doi.org/10.1108/K-04-2018-0185

[87] Julio CP, Jiménez A, Val PA. Viable System Model structuring of success factors in software projects. *International Journal Of Managing Projects In Business*. Https://Doi.Org/10.1108/Ijmpb-08-2016-0068

[88] Luftman J. Assessing Business-It Alignment Maturity; Source Title: strategies For Information Technology Governance. Copyright; 2004. https://doi.org/10.4018/978-1-59140-140-7.ch004.

[89] Nystrom CA, Design RF. The Viable System Model. *Syst Pract Action Res*. 2006;19(6):523–535.