

## **Editorial: Use of Generative AI in Research – A Cautionary Tale**

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Since the public release of ChatGPT, generative artificial intelligence (AI) has emerged as the latest disruptive technology that brings major changes to those from different walks of life. In academia, generative AI systems are also used by researchers to support their activities.

Generative AI systems are able to produce impressive-looking textual contents with simple natural language prompts from their users (University of Waterloo, 2024). However, the process that generates the contents is a “black box” for users. It is not possible for users of generative AI systems to trace the origins and accuracy of materials used to produce the contents. At the same time, generative AI systems are not “conscious” in their current forms (Klein, 2023). They are unable to understand and validate the contents they generate in the process. As such, the integrity of contents generated by generative AI systems is often questionable. ChatGPT and Google Bard (the predecessor of Google Gemini) are known for generating fabricated contents and references (Ratnatunga, 2023; University of Waterloo, 2024). To address the issue, Google Gemini utilises Google search engine to validate its contents, but the validation is an add-on rather than an integral part of the content generation process.

To gain a first-hand experience on the quality of contents generated by generative AI systems, the editorial team of Management Accounting Frontiers entered a question, “What are the key papers for TDABC?” into ChatGPT 3.5 (OpenAI, 2024) in May 2024 and the response was as follows:

*Several key papers have contributed to the development and understanding of Time-Driven Activity-Based Costing (TDABC). Here are some seminal papers that have shaped the field:*

*"Time-Driven Activity-Based Costing" by Kaplan and Anderson (2004): This paper, published in Harvard Business Review, introduced the concept of TDABC as a simplified and more accurate approach to*

*activity-based costing. It outlines the principles of TDABC and its application in various industries.*

*"Implementing Time-Driven Activity-Based Costing" by Kaplan and Anderson (2007): Building on their earlier work, the authors provide practical guidance on implementing TDABC in organizations. They discuss the steps involved in setting up a TDABC system and address common challenges.*

*"Time-Driven Activity-Based Costing: A Simpler and More Powerful Path to Higher Profits" by Kaplan and Anderson (2007): In this paper, the authors further elaborate on the benefits of TDABC, including its ability to improve decision-making, resource allocation, and performance measurement.*

*"Time-Driven Activity-Based Costing for Interlibrary Loan Services" by Sama and Bhattacharyya (2009): This paper demonstrates the application of TDABC in the context of interlibrary loan services in academic libraries. It provides a detailed case study of how TDABC can be used to calculate the cost of library services more accurately.*

*"Time-Driven Activity-Based Costing in Health Care" by Kaplan and Witkowski (2014): Focused on the healthcare industry, this paper explores the application of TDABC in healthcare delivery and management. It highlights the potential of TDABC to improve cost measurement, resource allocation, and process improvement in healthcare organizations.*

*"Time-Driven Activity-Based Costing for Service Industries" by Mecimore, Newman, and Sprano (2014): This paper discusses the application of TDABC in service industries such as professional services firms and insurance companies. It provides insights into how TDABC can be customized and implemented in service-oriented businesses.*

*"Time-Driven Activity-Based Costing: A Review of the Literature and an Agenda for Future Research" by Van der Stede and Chow (2015): This paper provides a comprehensive review of the existing literature on TDABC and identifies gaps and opportunities for future research. It offers valuable insights for scholars and practitioners interested in furthering the understanding of TDABC.*

*These papers represent foundational works in the field of Time-Driven Activity-Based Costing and have been influential in shaping both theory and practice in cost accounting and management.*

Among the works included in the above response, "Implementing Time-Driven Activity-Based Costing" and "Time-Driven Activity-Based Costing: A Review of the Literature and an Agenda for Future Research" were not from the authors listed above and the editorial team was unable to find any published work under the said titles. "Time-Driven Activity-Based Costing for Interlibrary Loan Services" was authored by Pernot, Roodhooft and Van den Abbeele in 2007 rather than 2009 (Pernot, Roodhooft and Van den Abbeele, 2007). The editorial team was also unable to verify the existence of "Time-Driven Activity-Based Costing for Service Industries" by Mecimore, Newman, and Sprano (2014).

A follow-up question, "Which journal the article "Time-Driven Activity-Based Costing: A Review of the Literature and an Agenda for Future Research" was published?" was entered into ChatGPT 3.5 after receiving the above response and the following answer was received:

*The article "Time-Driven Activity-Based Costing: A Review of the Literature and an Agenda for Future Research" was published in the journal Journal of Management Accounting Research.*

A review of the articles published at Journal of Management Accounting Research confirmed that this article did not exist.

When asked about the issue of the journal which the article was published, the system provided the following response:

*I don't have access to a specific database to look up the exact issue number. However, you can easily find this information by searching for the article title in academic databases like JSTOR, ScienceDirect, or Google Scholar. These databases typically provide detailed bibliographic information, including the journal issue and volume in which the article was published.*

However, when the editorial team entered another follow-up question, "Can you provide the full citation of "Time-Driven Activity-Based Costing: A Review of the Literature and an Agenda for Future Research" in Harvard format?", the following response was received:

*Certainly! Here's the full citation of the article "Time-Driven Activity-Based Costing: A Review of the Literature and an Agenda for Future Research" in Harvard format:*

*Van der Stede, Wim, and Chow, Chee W. (2015). "Time-Driven Activity-Based Costing: A Review of the Literature and an Agenda for Future Research." Journal of Management Accounting Research.*

*This citation includes the names of the authors, the year of publication, the title of the article, and the journal in which it was published.*

The citation provided above was not only incorrect but also incomplete as the volume number, issue number and page numbers were missing. However, the response read like the citation was a complete one.

The above interactions between ChatGPT and the editorial team confirmed the system was able to generate factually wrong responses and presented them in a convincing-looking way.

Given the ability of generative AI systems to present responses in a convincing-looking way, it appears that some researchers are utilising the outputs from generative AI systems without full awareness of the limitations of the systems and their outputs. In some cases, the contents from generative AI systems are incorporated into contents of published works directly with limited or no modification. For example, a search at Google Scholar in May 2024 by the editorial team of Management Accounting Frontiers shows 184 results with the phrase, “As of my last update in...”. The phrase is commonly used at the beginning of the content generated by ChatGPT. A review of the results shows that some of them are incorporated directly into the contents of published works.

While generative AI technology has the potential to support research activities, it is important for researchers to understand the limitations of the system and pay due diligence when utilising the outputs of generative AI systems.

## References

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