



Explorando o Potencial da IA Generativa na Pesquisa Científica

Prof. Dr. Roberto A.
Martins
DEP/UFSCar

DISCLAIMER

Esta apresentação
estará desatualizada
amanhã ou hoje ainda!

DISCLAIMER

Esta apresentação somente
trata de ferramentas com
acesso gratuito em parte ou
todo

Agenda

- Considerações sobre inteligência artificial
- Contexto sócio-econômico da aplicação da AI
- AI Generativa como um/a assistente
- AI Generativa no processo de pesquisa
- Reflexões

Agenda

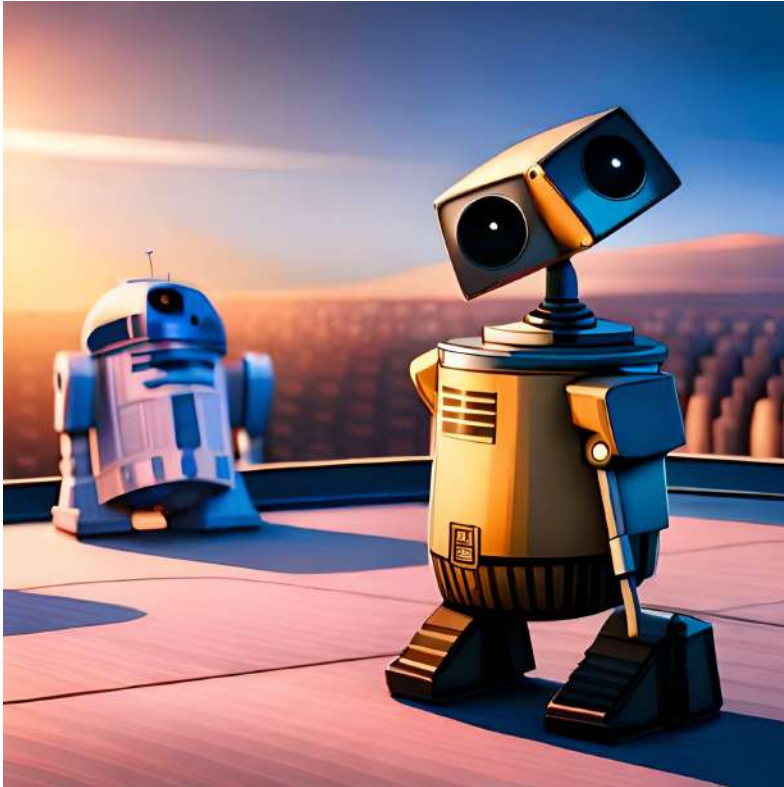
- *Considerações sobre inteligência artificial*
- Contexto sócio-econômico da aplicação da AI
- AI Generativa como um/a assistente
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- Reflexões

Considerações sobre AI

- Primeiros esforços com Alan Turing
- Vários tipos de AI e aprendizado de máquinas
- Vivemos um momento disruptivo com os GPTs ou virá mesmo com inteligência artificial geral (em inglês, AGI)?



Considerações sobre AI



- Natural Language Processing (NLP)
- **Generative Pre-trained Transformer (GPT)**
 - família de Large Language Model (LLM)
 - uso de deep learning (aprendizado profundo)
- Comunicação por predição (modelo estatístico)
 - apresenta "**alucinações**"

RO

Please provide an example of ChatGPT supporting a systematic literature review



Certainly, here is an example of how ChatGPT can support a systematic literature review:



A team of researchers at the University of Michigan used ChatGPT to support a systematic literature review on the effectiveness of telehealth interventions for managing chronic diseases. They trained the model on a dataset of abstracts and full-text articles related to telehealth and chronic disease management. They then used the model to generate summaries of each article, which were reviewed by the research team.

By using ChatGPT to generate article summaries and effort in the literature review process. They more efficiently, as the model highlighted the research team reported that ChatGPT was part across the literature and generating insights manually.

Overall, ChatGPT can be a useful tool for supporting automating the process of summarizing and analyzing

RO

Can you provide the URL regarding information above?



Unfortunately, I do not have a specific URL for this example as it is a hypothetical scenario based on the potential applications of ChatGPT in scientific research. However, the use of natural language processing and machine learning tools like ChatGPT to support systematic literature reviews is an area of active research and there are many studies that explore the potential of these tools in this context. If you're interested in this topic, I recommend searching for recent research papers on "systematic literature review" and "natural language processing" or "machine learning" to learn more about the latest developments and findings in this area.



🔄 Regenerate response

Mar/2023

Alucinações em AI Generativa

- Modelos estatísticos de inferência
 - Uso de amostras
 - Sujeito a erros de amostragem
- Transformar tudo em 0 e 1 (digitalização)

- Como eu **provavelmente** iniciaria o seminário às 8:00?
 - "Bom dia"
 - "Boa tarde"
 - "Boa noite"

Alucinações em AI Generativa

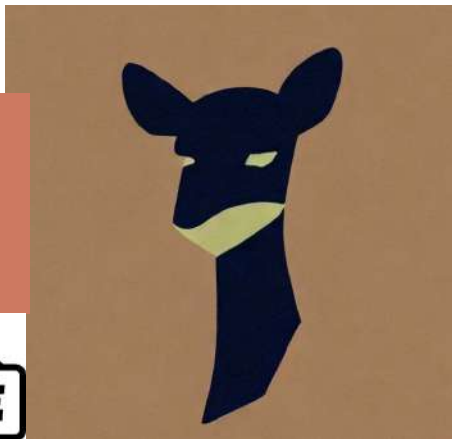
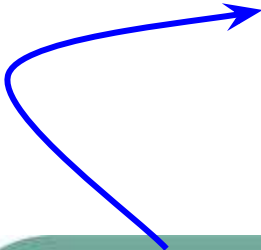
- Modelos estatísticos de inferência
 - Uso de amostras
 - Sujeito a **erros de amostragem**
- Transformar tudo em 0 e 1 (digitalização)

- Como eu **provavelmente** iniciaria o seminário às 8:00?
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ChatGPT

- Produto da OpenAI
- Versão
 - **paga** - 4.0
 - **gratuita** - 3.5
- Treinamento intensivo em bases de dados não reveladas
- Grande capacidade de comunicação escrita







ANTHROPIC
CLAUDE 2

ANTHROPIC

Meet Claude

Message Claude or search past chats...



Start a new chat >

Try these

Summarize this PDF document in a bullet point outline

Help me practice my Spanish vocab

Explain how this python game works

ANTHROPIC


Talk to Claude

Email

Email address

Continue with email

OR

 Continue with Google

Claude.ai is currently in open beta and usage of the platform may be limited for unpaid users.

Concorrente
do ChatGPT4

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⚡ GPT-3.5

⚡ GPT-4 🔒

ChatGPT

**Não faz
procura
na web**

Help me pick

a birthday gift for my mom who likes gardening

Compare storytelling techniques

in novels and in films

Write a thank-you note

to my interviewer

Show me a code snippet

of a website's sticky header

Prompt de interação

Send a message



ChatGPT

- Qualidade da resposta depende do **prompt**
 - necessário, mas suficiente
- Necessita de **curadoria** da resposta
 - especialista
 - oportunidade de aprendizado (método didático)
- Rede neural aprende conforme ela é usada
- Não é um oráculo
- Aceita API e acesso pago (tokens)
 - **permite desenvolver apps**
 - **inúmeros plug-ins para o ChatGPT 4**



Microsoft



OpenAI



VS

Alphabet



Bard AI

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ChatGPT

PONTOS FORTES

- Gerar conteúdos bem
 - códigos (Python, Java, R etc.)
 - imagens
 - estórias, letras de música, poesia
 - e-mails, cartas
- Correção de textos
- Diferentes tons de comunicação escrita
- Manipular uma grande quantidade de dados
- Code-interpreter

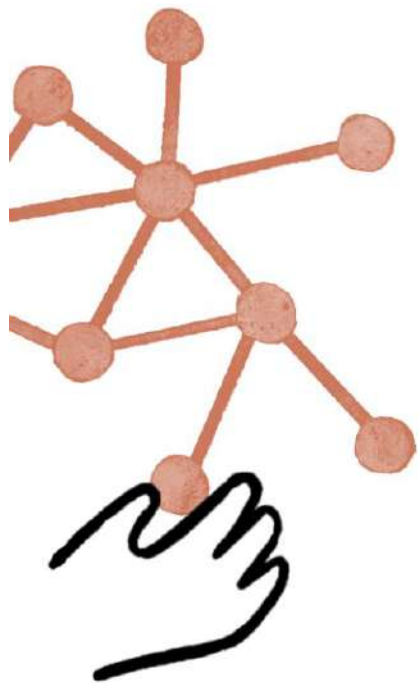
PONTOS FRACOS

- Alucinações
- Falta de originalidade na criação (generativo)
- Resposta incompleta ou simplista ou aproximadas
- Muito detalhista
- Falta de sensibilidade, inteligência emocional

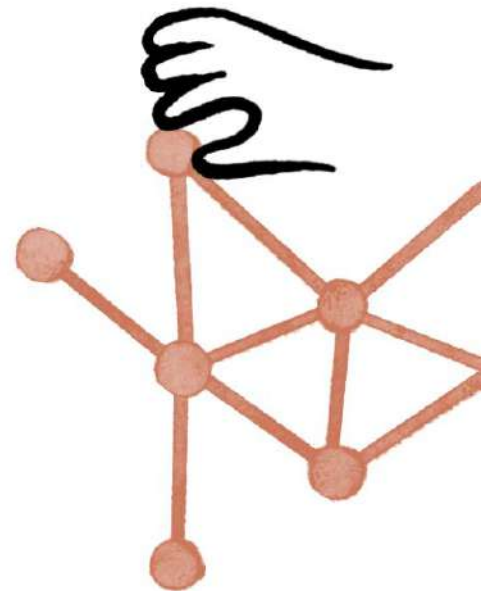


A new era for AI and Google Workspace





Meet Claude



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IA Generativa

*Um assistente de pesquisa
ou um co-piloto*



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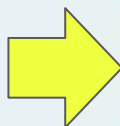




Identificação do Problema de Pesquisa

- **Dificuldade** para criar conteúdos originais
 - problemas de pesquisa já existentes
- **Auxilia**
 - mapear a literatura
 - testar questões de pesquisa
- IRIS.AI (pago para usar)
- ELICIT
- CONSENSUS
- Perplexity
- Textero.ai





considere-se um candidato ao processo de seleção para o mestrado em Engenharia de Produção e precisa para tanto apresentar um projeto de pesquisa. Sugira questões de pesquisa para um projeto sobre melhoria contínua

- ✓ Procurando por "questões de pesquisa para um projeto sobre melhoria contínua"
- ✓ Gerando respostas para você...

Aqui estão algumas sugestões de questões de pesquisa para um projeto sobre melhoria contínua:

1. Como a melhoria contínua pode aumentar a satisfação do cliente e trazer mais valor aos clientes ¹
2. Como a má qualidade dos dados afeta as empresas e como a melhoria contínua pode ajudar a resolver esse problema ¹
3. Como a falta de integração entre sistemas afeta as empresas e como a melhoria contínua pode ajudar a resolver esse problema ¹
4. Como a recepção de informações incorretas ou em um formato ruim afeta as empresas e como a melhoria contínua pode ajudar a resolver esse problema ¹

Essas são apenas algumas sugestões, mas existem muitas outras áreas em que a melhoria contínua pode ser aplicada para resolver problemas e aumentar a competitividade das empresas. Você pode encontrar mais informações sobre isso em ¹.

Saiba mais:

[1. analitico.blog](#)

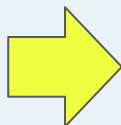
[2. provaseconcursos.com.br](#)

[3. monografias.brasile scola.uol.com.br](#)

[4. repositorio.unifei.edu.br](#)

[-- ver menos](#)

1 de 30 ●



considere-se um candidato ao processo de seleção para o mestrado em Engenharia de Produção no PPGPEP da UFSCar e precisa para tanto apresentar um projeto de pesquisa. Sugira questões de pesquisa para um projeto sobre melhoria contínua

- ✓ Procurando por "PPGPEP UFSCar questões de pesquisa para um projeto sobre melhoria contínua"
- ✓ Gerando respostas para você...

Aqui estão algumas sugestões de questões de pesquisa para um projeto sobre melhoria contínua no PPGPEP da UFSCar:

1. Como a melhoria contínua pode ser aplicada na gestão da qualidade na cadeia de suprimentos¹
2. Como a melhoria contínua pode ser aplicada no controle estatístico da qualidade¹
3. Como a melhoria contínua pode ser aplicada na qualidade no desenvolvimento de produtos¹
4. Como a melhoria contínua pode ser aplicada em sistemas de gestão da qualidade em serviços¹

Essas são apenas algumas sugestões, mas existem muitas outras áreas em que a melhoria contínua pode ser aplicada para resolver problemas e aumentar a competitividade das empresas. Você pode encontrar mais informações sobre isso em ¹. Além disso, é importante seguir as orientações do PPGPEP da UFSCar para elaboração do projeto de pesquisa ².

Considere-se um candidato ao título de mestre em Engenharia de Produção no PPGPEP da UFSCar sob orientação do Prof. Dr. Roberto A. Martins e precisa para tanto apresentar um projeto de pesquisa. Qual seria a questão de pesquisa para o seu projeto sobre sistemas de medição de desempenho para gestão da cadeia de suprimentos sustentável?

✓ Procurando por "MSc research project performance measurement systems sustainable supply chain management research questions"

✓ Gerando respostas para você...

Se você é um candidato ao título de mestre em Engenharia de Produção no PPGPEP da UFSCar sob orientação do Prof. Dr. Roberto A. Martins e precisa apresentar um projeto de pesquisa sobre sistemas de medição de desempenho para gestão da cadeia de suprimentos sustentável, aqui estão algumas perguntas de pesquisa que você pode considerar:

- Quais são os principais indicadores de desempenho para medir a sustentabilidade em cadeias de suprimentos¹
- Como os sistemas de medição de desempenho podem ser usados para melhorar a sustentabilidade em cadeias de suprimentos²
- Quais são os principais desafios enfrentados pelas organizações ao implementar sistemas de medição de desempenho para gestão da cadeia de suprimentos sustentável²
- Como os sistemas de medição de desempenho podem ser adaptados para atender às necessidades específicas das organizações brasileiras em relação à gestão da cadeia de suprimentos sustentável?

Essas são apenas algumas sugestões. É importante discutir suas ideias com o Prof. Dr. Roberto A. Martins para desenvolver uma questão de pesquisa que seja relevante e apropriada para o seu projeto.

Saiba mais: [1. researchgate.net](#) [2. emerald.com](#) [3. sciencedirect.com](#)



6 de 20



O que é gestão da cadeia de suprimentos sustentável?



Novo tópico



Pergunte-me qualquer coisa...



Considere-se um candidato ao processo de seleção do PPGEPP/UFSCar para o curso de Mestrado Profissional. Você pretende ser orientado do Professor Dr. Roberto Antonio Martins. Para tanto, proponha questões de pesquisa para um projeto sobre sistemas de medição de desempenho.

Aqui estão algumas possíveis questões de pesquisa para um projeto sobre sistemas de medição de desempenho, considerando que eu seja um candidato ao processo seletivo do PPGEPP/UFSCar para o curso de Mestrado Profissional e pretenda ser orientado pelo Professor Dr. Roberto Antonio Martins:

- Quais são os principais indicadores de desempenho utilizados atualmente pelas empresas e como eles podem ser aprimorados para refletir melhor a realidade organizacional?
- Como desenvolver um sistema de medição de desempenho que integre indicadores financeiros e não financeiros de forma equilibrada?
- Qual o impacto da adoção de um sistema de medição de desempenho no engajamento e motivação dos colaboradores?
- Como alinhar os indicadores de desempenho individuais e de equipe com os objetivos estratégicos da organização?

Questões Sugerida pelo Claude 2

- Quais são os principais indicadores de desempenho utilizados atualmente pelas empresas e como eles podem ser aprimorados para refletir melhor a realidade organizacional?
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- Qual o impacto da adoção de um sistema de medição de desempenho no engajamento e motivação dos colaboradores?
- Como alinhar os indicadores de desempenho individuais e de equipe com os objetivos estratégicos da organização?
- Que ferramentas e métodos podem ser utilizados para implementar um sistema de medição de desempenho de forma efetiva?
- Como garantir a confiabilidade dos dados e o uso ético das informações geradas pelo sistema de medição de desempenho?
- Quais características deve ter um sistema de medição de desempenho para apoiar a tomada de decisão gerencial no contexto de incerteza e volatilidade?
- Como avaliar os resultados da implementação de um sistema de medição de desempenho em termos de melhoria de processos e desempenho organizacional?

Ask a research question

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How do the companies use performance measurement systems to manage their supply chain?



SUMMARY OF TOP 4 PAPERS

BETA

The papers suggest that performance measurement systems are crucial for managing supply chains. Balfaqih (2016) and K (2019) both review the literature on supply chain performance measurement systems and find that they are essential for measuring efficiency and managing supply chains. Chan (2003) proposes a process-based

Add information about all papers

 Abstract summary

 Intervention

 Outcomes measured

Has PDF

Filter

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Paper title

Abstract summary



Review of supply chain performance measurement systems: 1998-2015

Hasan Balfaqih, Zulkifli Mohd. Nopiah, Nizaroyani Saibani, Malak...

Comput. Ind.

2016 Review 105 Citations [DOI](#)

Supply chain performance measurement is fundamental to efficient supply chain management over the past two decades.



A review on supply chain performance measurement systems

Jagan Mohan Reddy. K, Neelakanteswara Rao. A, Krishnanand. L

Procedia Manufacturing

2019 Review 44 Citations [DOI](#)

Simulation techniques are more suitable for supply chain performance measurement in a volatile environment.



Feasibility of performance measurement system for supply chain: a process-based approach and measures

F. Chan, Hongzhi Qi

2003 249 Citations [DOI](#)

A process-based performance measurement system is proposed.



Review of supply chain performance measurement systems

BalfaqihHasan, NopiahZulkifli Mohd., SaibaniNizaroyani, T Al-No...

Supply chain performance measurement is fundamental to supply chain management in various industries.

Tasks


[+ Create](#) Elicit recommended

Lit review: Explore research questions

Enter a research question, and get back answers from papers

Brainstorm research questions

Brainstorm more specific and related versions of your question

 Created by me Created by others

Get Independent (Manipulated) Variable and Dependent Variable from Hypothesis, Question, or Statement

Brainstorm research questions

Input:

performance measurement system for circular economy

Clear unstarred



- ☆ How can circular economy become more mainstream? How do other sectors move to circular economy?
- ☆ What are the main components of a circular economy?
- ☆ why is it important to measure the performance of our circular economy system?
- ☆ Is the circular economy a network-level phenomenon?
- ★ Are there good existing metrics for measuring the performance of circular economy policies or business models?
- ☆ What does recycling cost municipalities?
- ★ How do we measure value in the circular economy?
- ☆ what factors determine whether a circular economy exists or can be achieved?

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Beta

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Sign In



Ask a question, get conclusions from research papers



Ask a research question



Try Searching:

does creatine help build muscle?

what are benefits of mindfulness?

do direct cash transfers reduce poverty?

How to search?

Consensus uses AI to find answers in research papers. The best way to search is to ask a question.





beta

What the elements of a data-driven culture?



Synthesize

All years

Share This Page

We conclude that a data-driven culture is defined by following a specific set of values, behaviors and norms that enable effective data analytics.

Do we have a Data Culture?

Data Science – Analytics and Applications | Wolfgang Kremser et al. | 2019

Cite Share

The study identifies critical areas for managers to address in order to successfully implement a data-driven culture, including awareness and understanding, goal setting, assessing benefits and limitations, learning to trust data, and commitment to the culture.

Corporate Attitudes towards Big Data and Its Impact on Performance Management: A Qualitative Study

Sustainability | L. Pugna et al. | 2019

Cite Share

Creating a data-driven culture in schools requires shared leadership, according to the authors, who also emphasize the importance of leadership responsibilities, professional development responsibilities, and school culture responsibilities as precursors to effective data use.

Conditions for Effective Data Use to Improve Schools: Recommendations for School Leaders.

International Journal of Educational Leadership Preparation | C. Lange et al. | 2012

Cite Share

beta These features are in Beta and not 100% accurate. You can share feedback here

Summary

Top 8 papers analyzed

These studies suggest that a data-driven culture is defined by values, behaviors, and norms that enable effective data analytics, with key elements including leadership, goal setting, trust in data, and commitment to the culture, ultimately influencing innovation and performance.

Consensus Meter

Not a 'Yes or No' question. To use the Consensus Meter, try asking a simple Yes/No question.

E.g. Does beta alanine improve exercise performance?

We conclude that a data-driven culture is defined by following a specific set of values, behaviors and norms that enable effective data analytics.

Do we have a Data Culture?

Data Science – Analytics and Applications | Wolfgang Kremser et al. | 2019

Cite Share

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Corporate Attitudes towards Big Data and Its Impact on Performance Management: A Qualitative Study

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beta

What the elements of a data-driven culture?



Finding

Enhanced

The study identifies critical areas for managers to address in order to successfully implement a data-driven culture, including awareness and understanding, goal setting, assessing benefits and limitations, learning to trust data, and commitment to the culture.

Share Finding

Paper

Journal

Corporate Attitudes towards Big Data and Its Impact on Performance Management: A Qualitative Study

Sustainability | Citations: 28 | 2019

Cite Full text

Abstract

This paper investigates the organizational challenges raised by Big Data and its impact on the business environment with a focus on performance management. We investigate managers' perceptions, understanding, and attitudes relating to Big Data and its analytics, in terms of opportunities, extent, limitations, challenges, and implications, with specific reference to performance management. The research methodology we adopt is grounded theory: we develop a reflection guide based on research questions covering the impact and challenges of a data-driven culture on business, and the impact on performance management and the decision-making process. The results obtained from senior executives from 21 Romanian companies leads to a conceptual model that distils the major areas arising from the responses and the interrelationships between them. These reveal several key areas of managerial relevance and suggest fruitful action. In particular, we find that the most critical areas requiring intervention lie in the area of awareness and understanding, goal setting, assessing benefits and limitations, learning to trust data, and commitment to an embedded data-driven culture. In addition to changes within organizations themselves, there are also implications for other stakeholders, such as education providers.

Authors

I. Pugna, Adriana Duțescu, O. Stănilă

Sustainability

New Thread Ctrl I

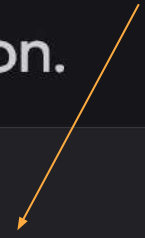
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The answer to any question.



What are the elements of a data-driven culture?


Focus Copilot · 5 →



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- guide on how to ski
- design garbage collector c++
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- Discover
- My Threads
- AI Profile

What are the elements of a data-driven culture?

Copilot

Searching web

elements data-driven culture data-driven culture characteristics building data-driven culture

Considering 19 sources

Sources

5 Obvious Characteristics... zipreporting · 1	What Does It Actually Take... hbr · 2	5 Key Elements of a Data-... awscloud · 3	6 traits of data-driven... cio · 4
3 ways to build a data-... mit · 5	The Key Elements of A Dat... anmut · 6	4 Characteristics of a Data... doubleverify · 7	Building A Data Driven... google · 8

Answer

Elements of a Data-Driven Culture

A data-driven culture is one where the workforce uses analytics and statistics to optimize their processes and accomplish their tasks ¹⁴. It is a culture that is built on a strong foundation of numbers and analytics, where data is used to inform decisions and make changes to how the business operates ¹³. Here are some key elements of a data-driven culture:

1. **Executive commitment:** A data-driven culture starts at the top. Companies with strong

Ask follow-up... Copilot · 4

infrastructure that supports data-driven processes and decision-making

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comprehensive data strategy that applies across the organization ⁴. This includes standardizing processes and metrics to ensure consistency in data collection and analysis ¹¹.

- Continuous improvement:** A data-driven culture is always looking for ways to improve. This means using data to measure performance and identify areas for improvement ¹⁰. Companies should also invest in analytics tools to help them stay ahead of the curve ¹¹.

Remember that building a data-driven culture is hard and requires a team effort ². It is important to start at the top and get everyone involved ¹¹. By prioritizing data literacy, democratizing data, and fostering collaboration, companies can create a culture that is focused on making data-driven decisions and improving performance.



Related

how to foster a data-driven culture in an organization +

benefits of having a data-driven culture +

challenges in implementing a data-driven culture in an organization +

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Ask your question

What is the nexus between complexity theory and performance measurement systems?

Search

Performance Measurement and Management Systems: A Perspective from Complexity Theory

[Text summary](#) [Abstract](#)

S. Okwir; S. Nudurupati; Matías Ginieis

International Journal of Management Reviews

2018 57 citations [DOI](#) [PDF](#)

This paper presents a meta-analyses of six major types of PMS systems and finds that among them, four are agnostic of the external environment and three are agnostics of the internal environment.

NEXUS BETWEEN PERFORMANCE MEASUREMENT SYSTEMS AND PSYCHOLOGICAL EMPOWERMENT IN THE PHARMACEUTICAL INDUSTRY

[Text summary](#) [Abstract](#)

Umer Ishfaq; S. Batool; Sultan Salahuddin

Humanities & Social Sciences Reviews

2021 - [DOI](#) [PDF](#)

Purpose of the study: The purpose of this study is to examine the impact of interactive performance measurement systems on the employees' psychological empowerment in the pharmaceutical industry in Pakistan.

Methodology: This research used a survey and the respondents were medical representative/detailer employees in the pharmaceutical firms in Pakistan. Data was collected from 390 responding out of 650 distributed questionnaires and analyzed by using Smart PLS.

Main Findings: The outcomes of this study showed that the interactive performance measurement system has a positive and significant impact on the employees' psychology in the pharmaceutical industry in Pakistan.

Applications of the study: This research showed that the interactive performance measurement system is a tool that can open the communication network between the managers and the employees





Revisão da Literatura

- Uma das maiores contribuições
- Buscas em bases abertas ou abstracts de bases pagas
- Importar buscas feitas em SCOPUS ou WoS (BibTex, RIS)
- Auxilia
 - buscar literatura
 - identificar potencial de leitura
 - resumir
 - gerenciar referências
- ELICIT, RESEARCH RABBIT, LITMAPS, CONNECTED PAPERS, SYSTEMS PRO, RESEARCH BUDDY



research question

What are the success factors for implementing Industry 4.0?

SUMMARY OF TOP 4 PAPERS BETA

The papers collectively suggest that there are critical success factors for implementing Industry 4.0. Sony (2020) identified 10 critical success factors, while Bongo (2020) identified 7 critical success factors. These factors include understanding the socio-technical requirements (Davies, 2017), leveraging internal capabilities (Davies, 2017), and

Add information about all papers

- Abstract summary ✓
- Intervention ✓
- Outcomes measured ✓

Search for paper information

What was the...

Mais opções:
main findings
detailed abstract summary
research design

Paper title

Intervention

Outcomes measured



Pros and cons of implementing Industry 4.0 for the organizations: a review and synthesis of evidence

M. Sony

2020 Review 5

Scimago Journal Rank 0.373 Q2

The Scimago Journal Rank (SJR) score measures the influence of a journal within a sub-discipline. It is divided into four quartiles, with Quartile 1 (Q1) being the highest (top 25% of journals) and Quartile 4 (Q4) being the lowest (bottom 25%).



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What are the success factors for implementing Industry 4.0?



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The papers collectively suggest that there are critical success factors for implementing Industry 4.0. Sony (2020) identified 10 critical success factors, while Bongo (2020) identified 7 critical success factors. These factors include understanding the socio-technical requirements (Davies, 2017), leveraging internal capabilities (Davies, 2017), and

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Critical factors for the successful implementation of Industry 4.0: a review and future research direction

M. Sony, Subhash S. Naik

2020 Review 132 Citations DOI

Focusing on these 10 critical success factors will help organizations to be sustainable during the implementation of Industry 4.0 in their organizations.



Review of Socio-technical Considerations to Ensure Successful Implementation of Industry 4.0

Robert Davies, Tim Coole, Alistair Smith

2017 Review 92 Citations DOI

Industry 4.0 and lean manufacturing methods are mutually supportive.



What Drives the Implementation of Industry 4.0? The Role of Opportunities and Challenges in the Context of Sustainability

J. Müller, Daniel Kiel, K. Voigt

2018 524 Citations DOI PDF

Strategic, operational, as well as environmental and social opportunities are positive drivers of Industry 4.0 implementation.

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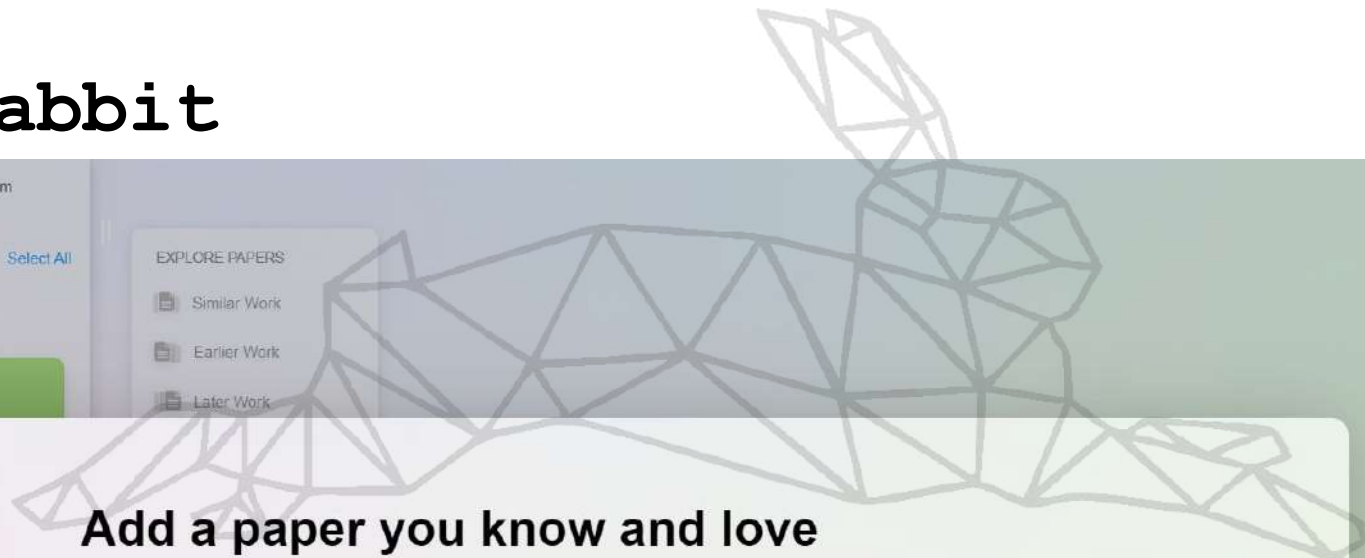
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From Artificial Intelligence to Explainable Artificial Intelligence in Industry 4.0: A Survey on What, How, and Where

IEEE Transactions on Industrial Informatics

Nowadays, Industry 4.0 can be considered a reality, a paradigm integrating modern technologies and innovations. Artificial intelligence (AI) can be considered the leading component of the industrial transformation enabling intelligent machines to execute tasks autonomously such as self-monitoring, interpretation, diagnosis, and analysis. AI-based methodologies (especially machine learning and deep learning support manufacturers and industries in predicting their maintenance needs and reducing downtime. Explainable artificial intelligence (XAI) studies and designs approaches, algorithms and tools producing human-understandable explanations of AI-based systems information and decisions. This article presents a comprehensive survey of AI and XAI-based methods adopted in the Industry 4.0 scenario. First, we briefly discuss different technologies enabling Industry 4.0. Then, we present an in-depth investigation of the main methods used in the literature: we also provide the details of what, how, why, and where these methods have been applied for Industry 4.0. Furthermore, we illustrate the opportunities and challenges that elicit future research directions toward responsible or human-centric AI and XAI systems, essential for adopting high-stakes industry applications.

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We use a proprietary data set from a national US department store chain to investigate the impact of competitor store closures on a major retailer. The transaction level data set includes nearly 80 million transactions, corresponding to \$2 billion in sales over a 25-month period. We find that store sales increase with respect to a store's proximity to closed competitor locations. More interestingly, we find that online channel sales also increase in geographic locations where competitors close stores and where our focal retailer has store locations in close proximity to the markets it serves. This latter finding highlights the important role that stores play in the online channel. Stores provide a level of shopping assurance generally not available online and support customer webrooming and showrooming to mitigate purchase uncertainty. Stores are also integral to omnichannel services like return-to-store wherein stores provide a convenient nearby location to make a free return should an online purchase not meet expectations. Consistent with these shopping behaviors, our results demonstrate that the focal retailer, in markets affected by competitor store closures, is able to capture demand that exhibits greater uncertainty in purchases as evidenced by (i) a disproportionate increase in riskier high value vs. low value

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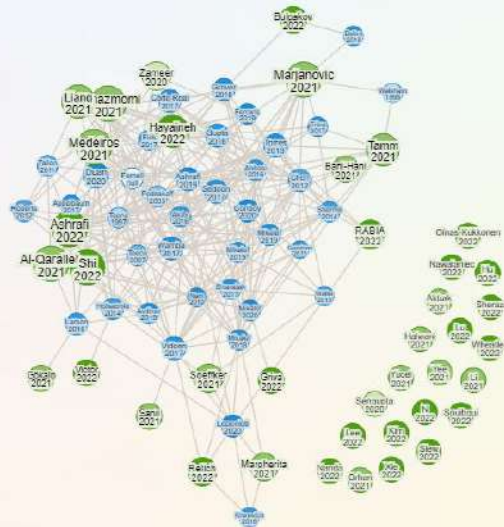
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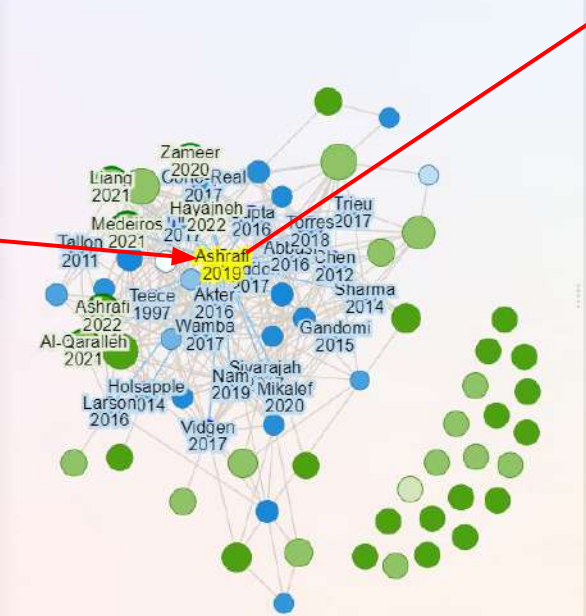
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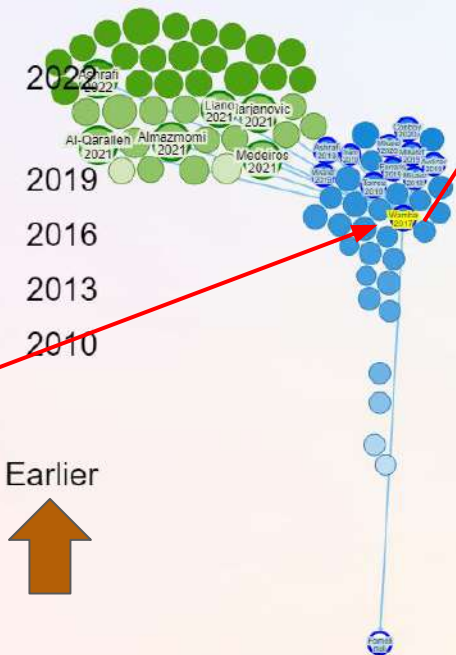
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Drawing on the resource-based view and the literature on big data analytics (BDA), information system (IS) success and the business value of information technology (IT), this study proposes a big data analytics capability (BDAC) model. The study extends the above research streams by examining the direct effects of BDAC on firm performance (FPER), as well as the mediating effects of process-oriented dynamic capabilities (PODC) on the relationship between BDAC and FPER. To test our proposed research model, we used an online survey to collect data from 297 Chinese IT managers and business analysts with big data and business analytic experience. The findings confirm the value of the entanglement conceptualization of the hierarchical BDAC model, which has both direct and indirect impacts on FPER. The results also confirm the strong mediating role of PODC in improving insights and enhancing FPER. Finally, implications for practice and research are discussed.

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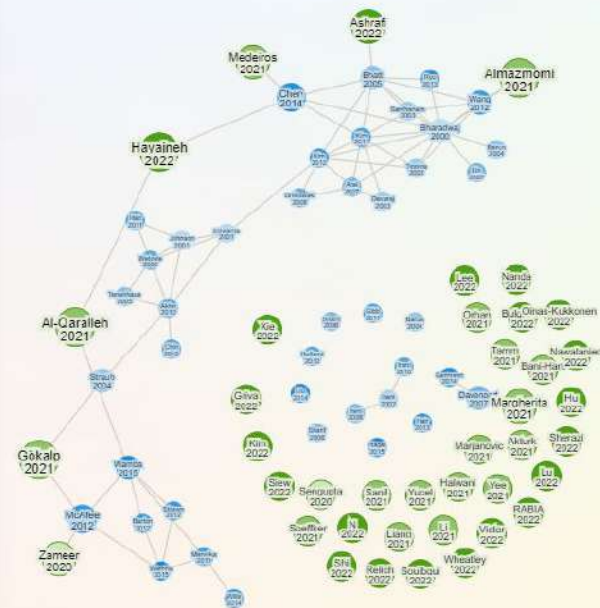
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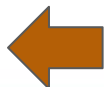
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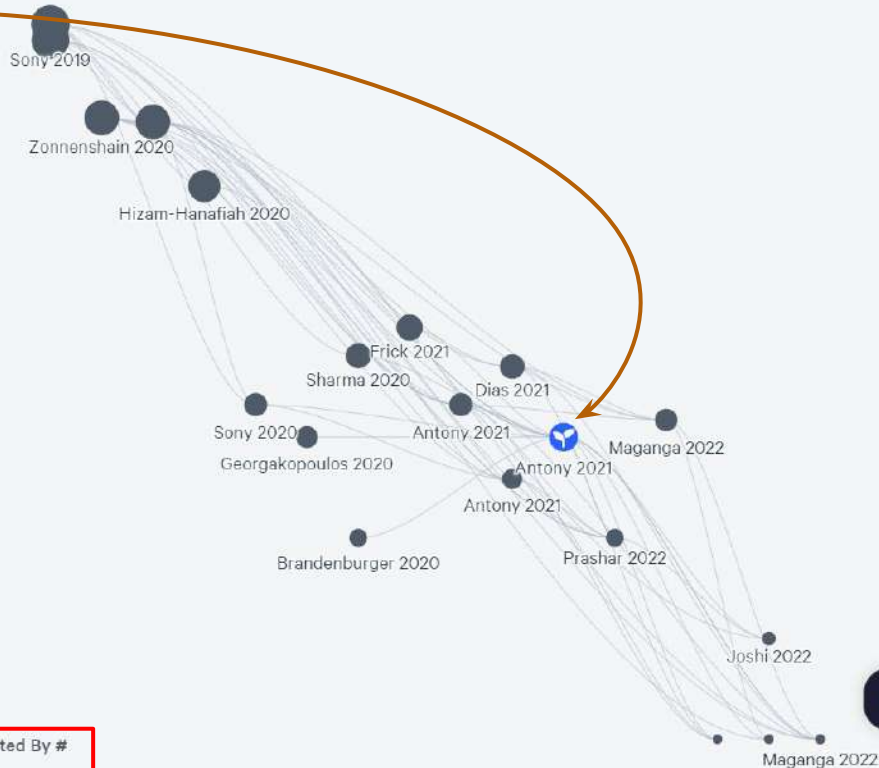
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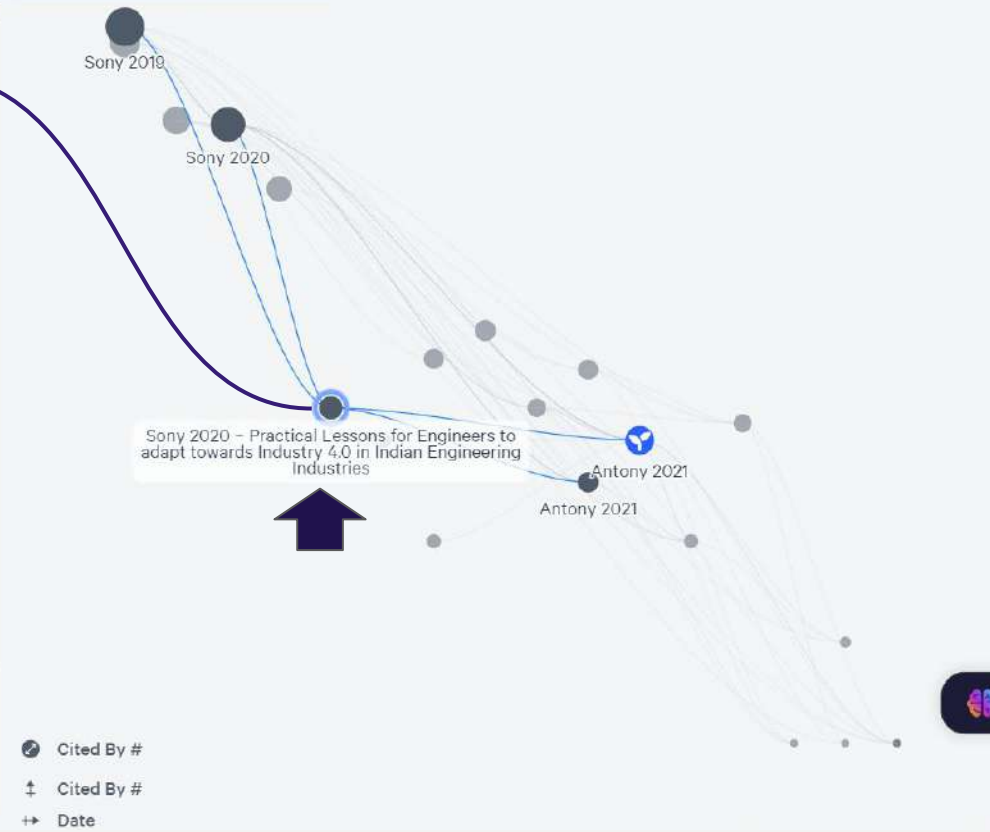
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ABSTRACT

Industry 4.0 is the current buzzword in the modern organization. It promises to revolutionize the Industry with automation and computing technologies. Indian Engineering Industry is the largest segment among the Indian Industries having a huge export potential. Industry 4.0 is making inroads into this high potential Industry in a gradual manner. There are very few studies as to how should engineers adapt with the skills and ability requirements of knowledge society created due to the application of Industry 4.0. The main aim of this paper is to critically analyze the previous studies so that engineers can adapt to Industry 4.0. This study finds in disciplines engineers must adapt to...

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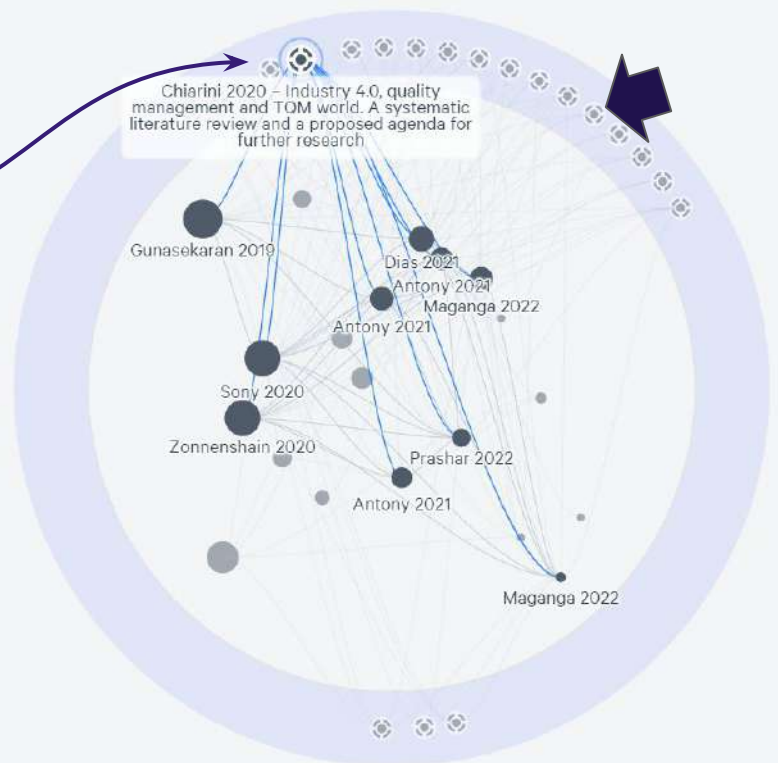


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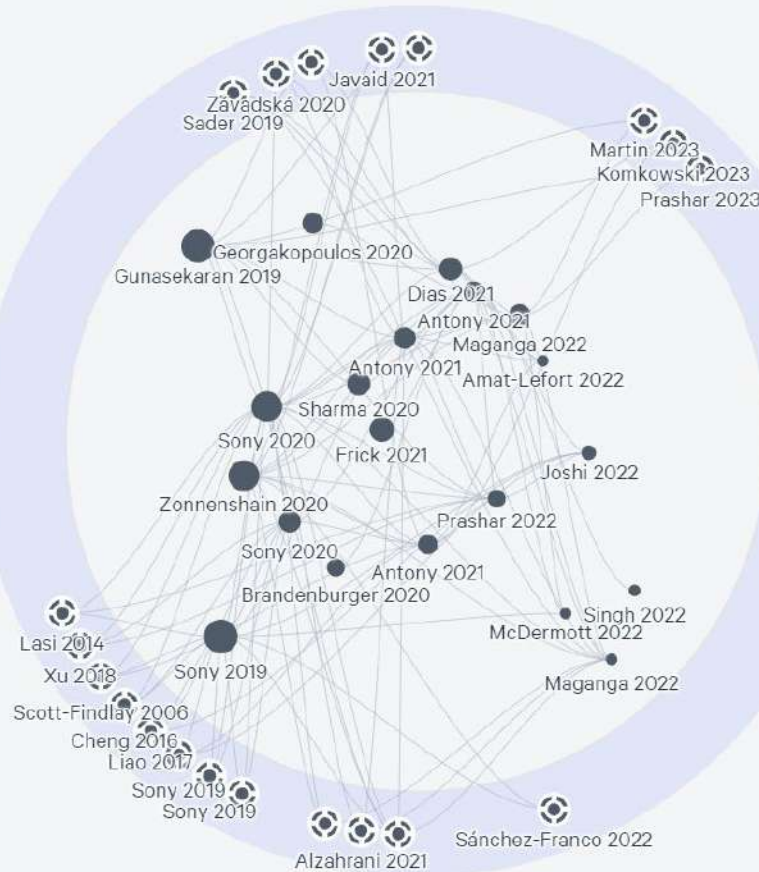
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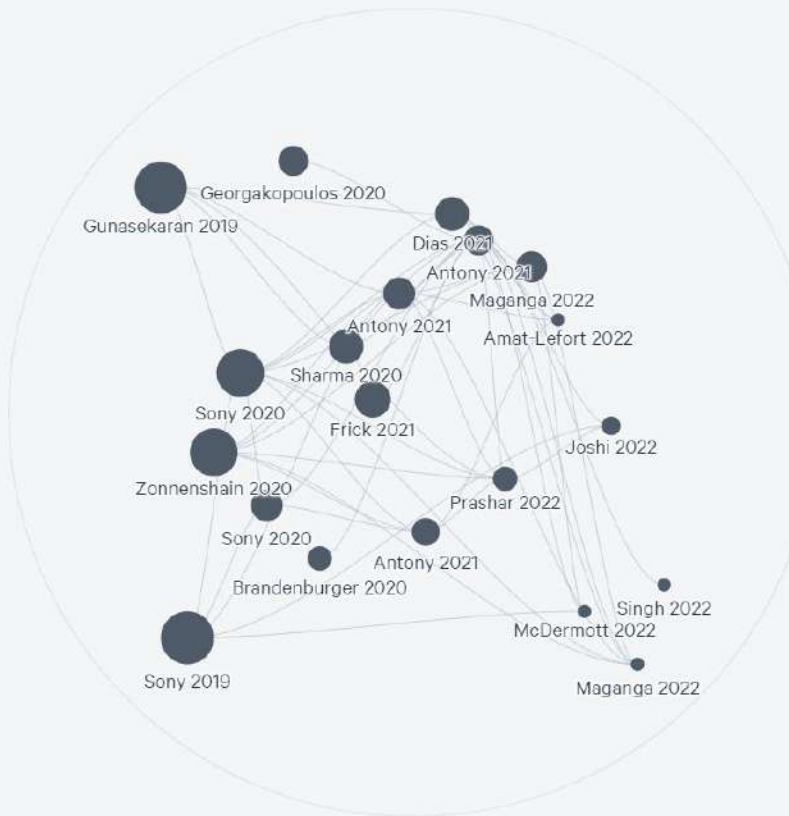
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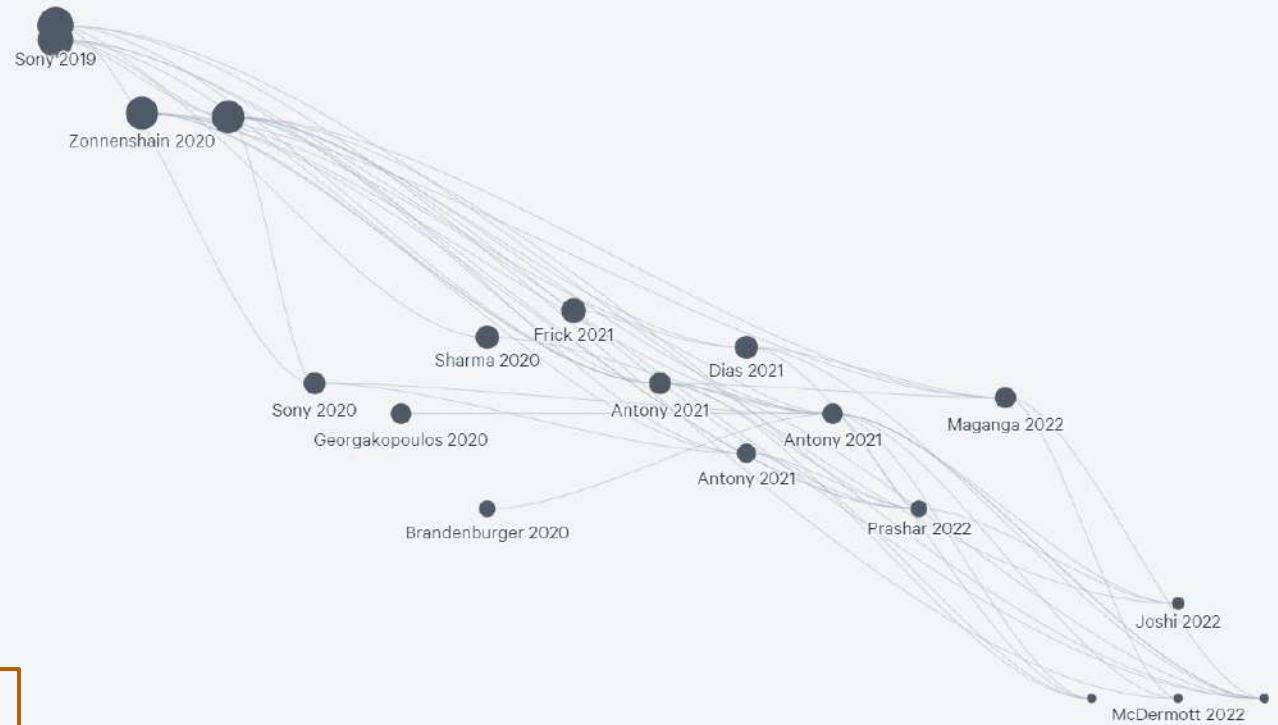
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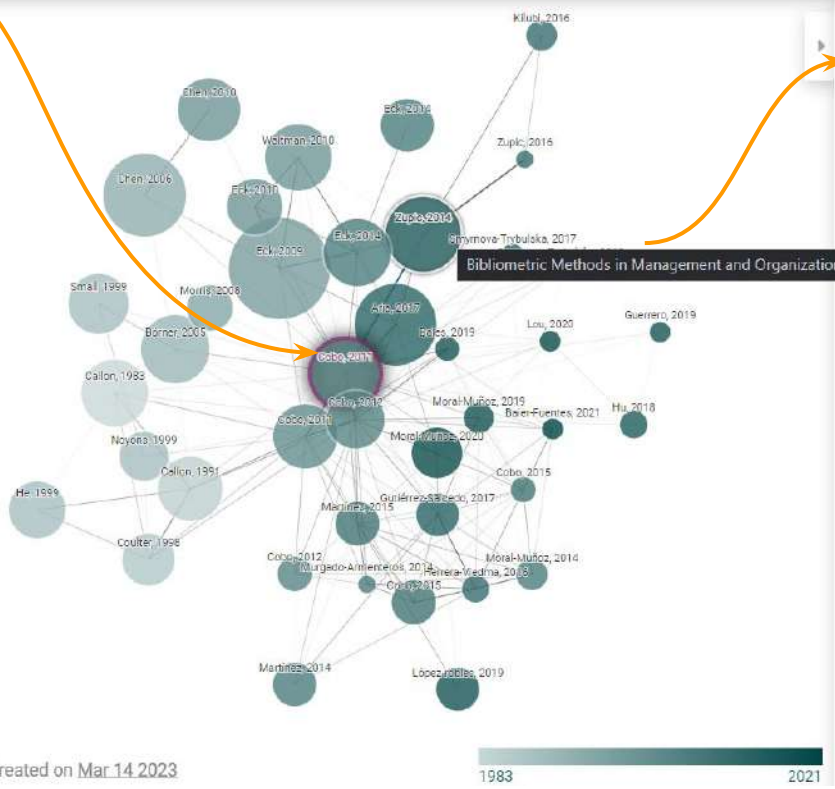
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Science mapping software tools: Review, analysis, and cooperative study among tools

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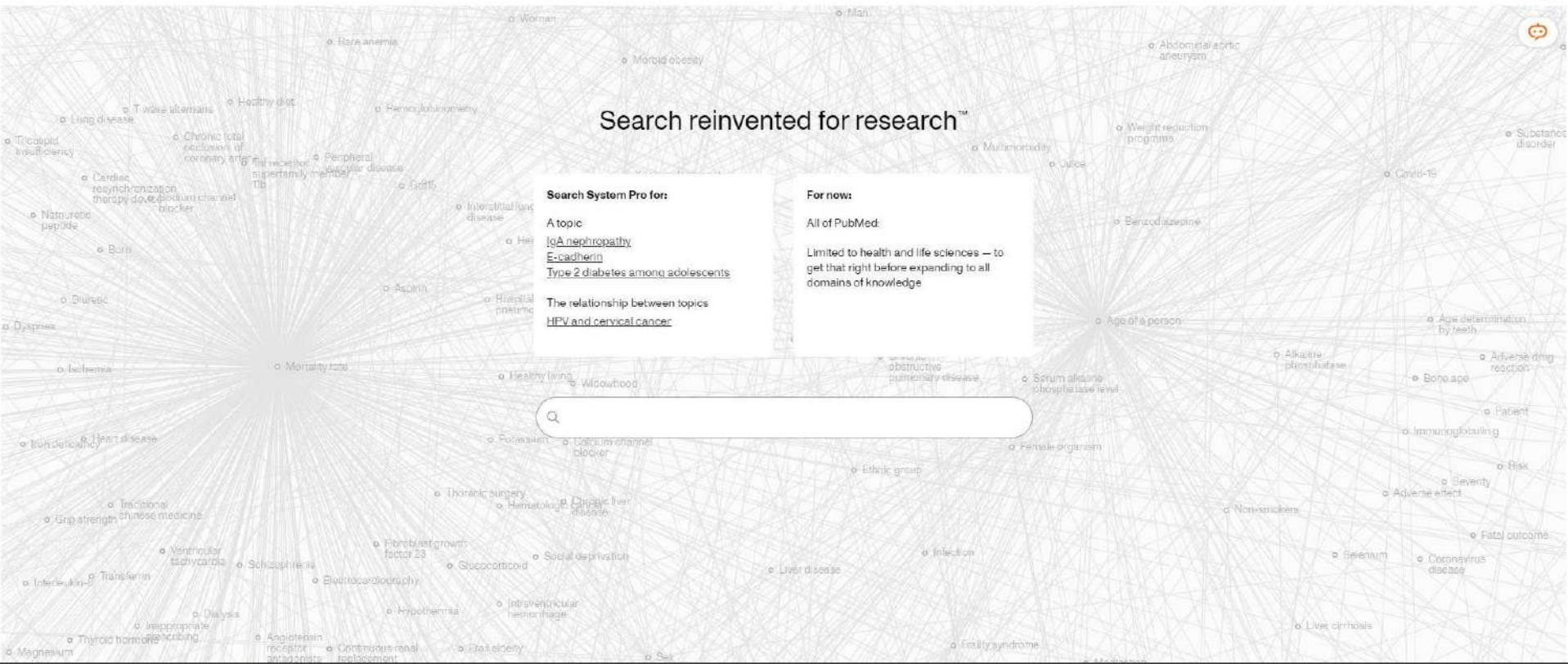
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Identification and Visualization of the Intellectual Structure in Graphene Research
Benjamín Vargas-Quesada, Zaida Chinchilla-Rodríguez, N. Rodríguez
2017, Frontiers in Research Metrics and Analytics ...

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After discovering the promising properties of graphene, the research in the field is attracting large grants and sponsors with an exponential rise in the number of papers and applications. This paper presents a global map of graphene research and its intellectual structure through the terms of more than 50,000 documents extracted from Scopus database from 1998 to 2015. The unit of analysis has been the descriptors (including Authors keywords and Indexed keywords) and its co-occurrence, using fractional counting, as unit of measure. The main research lines identified are: Fundamental



Studies 254,806

Synthesis

Map

PUBLISH DATE ▾

STUDY TYPE ▾

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STUDY TITLE	JOURNAL	AUTHORS	STUDY SUMMARY	CITED BY	PUBLISH DATE
Analyzing the service quality priorities in cargo transportation before and during the Covid-19 outbreak	Transport Policy	Aybike Tuha Ozden Erkan Celik	This study is the first using the FIPIA method in determining the service quality priorities of consumers using cargo service. The application of promotion and courteousness, and politeness of the personnel had the highest value in all service quality priority before the Covid-10 outbreak.	6	2021
Examining the effect of logistics service quality on customer satisfaction and re-use intention.	PloS One	Xiaofang Lin +3 more	For logistics service providers, improving customer satisfaction and obtaining customer re-use intention are key to gaining sustainable competitive advantages and success. The data were obtained from an online survey using a structured questionnaire given to those with experience in logistics service. The study found that operational, resource, information, personal contact, and customization qualities positively affect the satisfaction of logistics service customers.	0	2023
Saudi service users' perceptions and experiences of the quality of their mental health care provision in the Kingdom of Saudi Arabia (KSA): A qualitative inquiry.	International Journal Of Mental Health Nursing	Yaqoub Al Mousa +3 more	This paper presents a theoretical understanding of issues pertinent to the quality of mental health care in the KSA from the perspective of those using services. Semi-structured interviews were conducted with thirty service users admitted to inpatient psychiatric wards. Structural aspects of care include staff experience and qualifications and key enablers around social and financial support, service users' health needs and status.	0	2021
Multilevel analysis of sleep quality and anger in emergency medical service workers.	Sleep Health	Bryce Hruska +2 more	The current study performed a multilevel analysis of the relationship between sleep quality and anger among EMS workers in Central New York. The findings suggest interventions targeting both between- and within-person factors impacting sleep may be important for addressing the influence of sleep quality in the EMS profession.	1	2022
Service quality measurement: appointment systems in U.K. GP practices.	International Journal of Health Care Quality Assurance	Martyna Sliwa James O'Kane	This article assess service quality measurement by focusing on general practice appointment systems. It offers insights into service quality's subjective and context-dependent nature. Broader applications to	6	2011

Patient Satisfaction

Patient satisfaction is a vital component of healthcare quality, as multiple studies have consistently shown a positive association between quality of healthcare and increased patient satisfaction¹. This highlights the importance of delivering high-quality services that meet the needs and expectations of patients. Additionally, the utilization of preventive services has been found to enhance client satisfaction, emphasizing the significance of proactive healthcare measures². Antenatal care services provided by different types of health facilities have been associated with improved utilization and greater patient satisfaction³. It is crucial to reduce waiting times for emergency medical services, as it has been found to significantly impact the satisfaction levels of patients⁴. Ultimately, patient satisfaction not only reflects the quality of care but also plays a role in enhancing the overall quality of life for individuals receiving healthcare services⁵.

Perceived Service Quality

The perception of service quality is an important aspect of healthcare delivery. Studies have shown that agreeableness, or the quality of being pleasant and accommodating, is positively associated with perceived service quality, indicating the significance of a positive interpersonal experience in

Methodology

This is a synthesis of the findings of the top 10,000 studies on the previous tab, ranked using PubMed Best Match algorithm (which takes into account past usage of an article, publication date and relevance score among other factors). It is generated by extracting the statistical, mechanistic, and causal findings from those studies, grouping those findings based on similarity, then prompting a large language model to summarize that information and back up each claim with a citation. While many measures are in place to ensure accuracy, error is still possible.

1

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STUDY/TITLE	JOURNAL	EXTRACTED FINDINGS	STUDY POPULATION	CITED BY	PUBLISH DATE
A Study on the Experience of Patients regarding the Quality of Healthcare services provided in the Alipurduar District of India	Journal of Healthcare Quality Research	↗ Quality of healthcare is associated with a 0.77 unit increase in patient satisfaction	300 patients from three hospitals in Alipurduar District, India	2	2020
Positioning Patient-Perceived Medical Services to Develop a Marketing Strategy	The health care manager	↗ Determinants of service satisfaction is associated with a 0.61 unit increase in patient satisfaction ±Lmore	282 students of the College of Public Health and Medicine in Seoul	6	2012

Studies 254,806

Synthesis

Map


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STUDY TITLE	JOURNAL	EXTRACTED FINDINGS	STUDY POPULATION	CITED BY	PUBLISH DATE
A Study on the Experience of Patients regarding the Quality of Healthcare services provided in the Alipurduar District of India	Journal of Healthcare Quality Research	Quality of healthcare is associated with a 0.77 unit increase in patient satisfaction.	300 patients from three hospitals in Alipurduar District, India.	2	2020
FINDING		Pearson Correlation 0,770 p-value: N/A CI: N/A			
Positioning Patient-Perceived Medical Services to Develop a Marketing Strategy	The health care manager	Determinants of service satisfaction is associated with a 0.61 unit increase in patient satisfaction.	262 students of the College of Public Health and Medicine in Seoul.	6	2012

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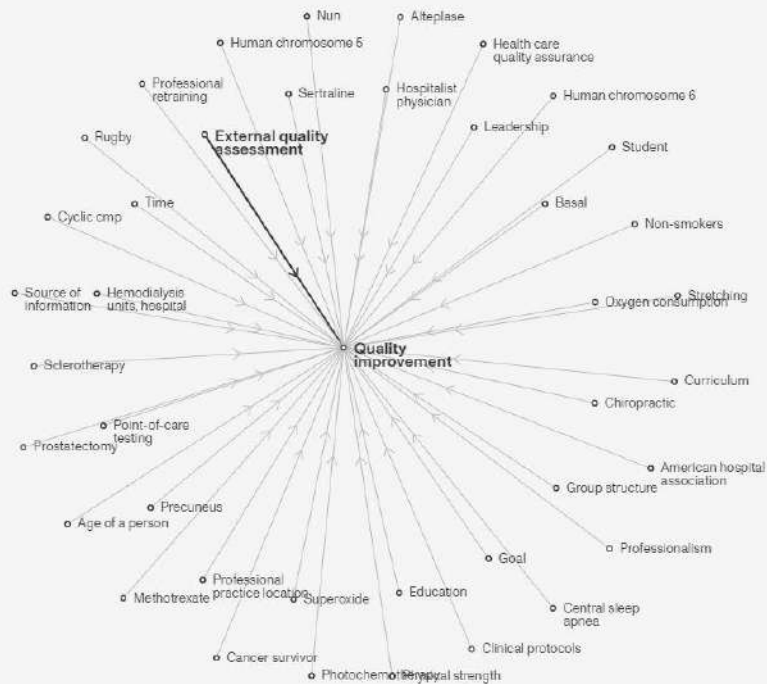
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DEFINITIONS ▾

Impact of external quality assessment on quality improvement

System has established this relationship based on 4 statistical findings. ⓘ

VARIABLE 1	pretest group [vs post-test group]
VARIABLE 2	quality improvement knowledge test score
MEAN GAIN (STAN.)	-0.3
P-VALUE	0.003
EXTRACTED FROM	(2023) Journal of Continuing Edu
VARIABLE 1	pretest group [vs post-test group]
VARIABLE 2	quality improvement self-efficacy score
MEAN GAIN (STAN.)	-118
P-VALUE	0.001
EXTRACTED FROM	(2023) Journal of Continuing Edu
VARIABLE 1	Pre-test [vs Post-test]
VARIABLE 2	Quality of performance score
MEAN GAIN (STAN.)	-0.0
P-VALUE	0.001



WHAT IS THIS MAP?

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DEFINITIONS ▾

Impact of quality improvement on inpatient care

System has established this relationship based on 4 statistical findings: ⓘ

VARIABLE1 starting/completing an ILD-related quality improvement project in the previous 2 years

VARIABLE2 risk of hospitalization

RELATIVE RISK RAT... 0.6

P-VALUE 0.001

95% CI 0.440 to 0.820

EXTRACTED FROM (2022) Respiratory Research

VARIABLE1 Health Teams Advancing Patient Experience: STRengthening QualityY intervention

VARIABLE2 odds of having 1 or more hospital admission

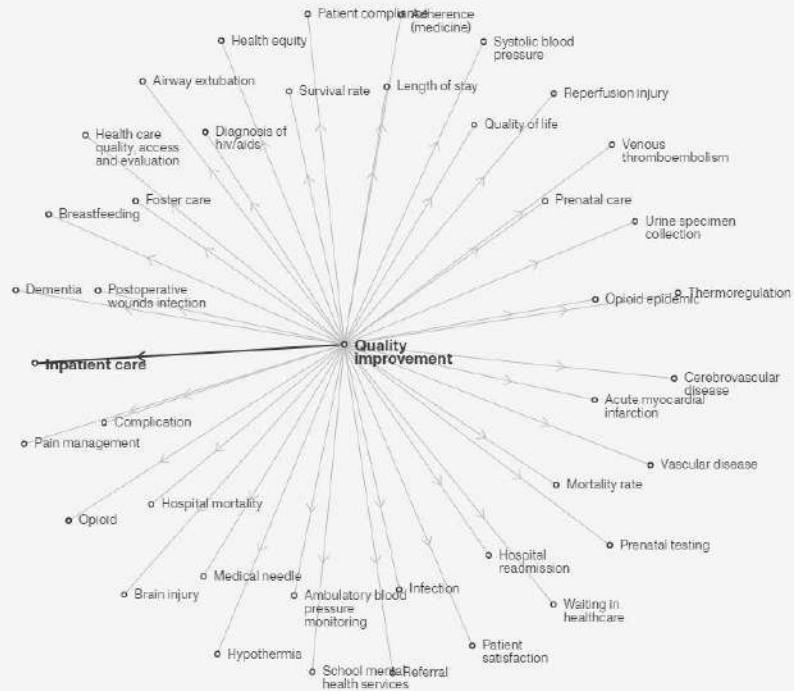
FREQUENCY SCORE 0.44

P-VALUE N/A

95% CI 0.200 to 0.950

EXTRACTED FROM (2019) Canadian Medical Associa

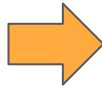
VARIABLE1 attainment of clinical performance



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Your Literature Review

Corporate Environmental Performance Measurement

Scope

The field of corporate environmental performance measurement has garnered significant attention within the academic community. Numerous publications have been devoted to this subject area, highlighting the growing interest and importance placed on environmental performance by businesses. The breadth of literature available on this topic is extensive, covering various aspects of corporate environmental performance measurement including methodologies, indicators, frameworks, and case studies. Researchers have explored both quantitative and qualitative approaches to measure environmental performance, leading to a diverse range of publications in this field.

In terms of quantity, the number of publications in the field of corporate environmental performance measurement has steadily increased over the years. This is indicative of the growing awareness and recognition of the significance of environmental performance in corporate decision-making and sustainable business practices. The rate of publication in this area suggests that scholars are actively researching and contributing to the development of knowledge in this field. The diversity of authors and institutions engaged in publishing research papers is also indicative of the global interest and involvement in this subject area.

Citation activity is another important measure of the impact and influence of published literature. Analysis of citation patterns reveals the reach and relevance of research in corporate environmental performance measurement. The presence of highly cited papers and the frequent referencing of key theories, frameworks, or methodologies indicate the depth and significance of the literature in this field. Moreover, a closer examination of citation networks and the degree of cross-referencing among publications can provide insight into the interconnectedness and evolution of ideas within this research domain.

In summary, the literature on corporate environmental performance measurement is both extensive and dynamic. The increasing quantity of publications highlights the growing interest in this field, reflecting the rising significance of environmental performance in business practices. The depth of the literature is evidenced by the diverse range of topics covered and the substantial citation activity surrounding key papers and concepts. As researchers continue to delve into this subject area, it is expected that the literature will continue to expand and evolve, contributing to the advancement of knowledge in corporate environmental performance measurement.

Theme 2: Methodologies For Performance Measurement

Theme 2 delves into the methodologies employed to measure corporate environmental performance. The literature explores both qualitative and quantitative approaches, including life cycle assessment, environmental management systems, and sustainability reporting. It discusses the advantages and limitations of each methodology and emphasizes the need for a comprehensive and integrated approach to capture the multidimensional nature of environmental performance. The debate within this theme centers around the trade-offs between accuracy, complexity, cost-effectiveness, and the ability to capture both immediate and long-term impacts.

🔍 Theme 1: Definition And Conceptualization Of Corporate Environmental Performance Measurement

This theme focuses on the various definitions and conceptual frameworks used in measuring the environmental performance of corporations. It explores different approaches, indicators, and metrics employed to assess environmental performance.

📖 Laszlo, C., & Zhexembayeva, N. (2011). **Embedded sustainability: The next big competitive advantage.** Stanford University Press.

Summary: This paper explores the concept of embedded sustainability, which refers to integrating sustainability into the core business strategy and operations of a company. The authors argue that companies that embrace embedded sustainability can gain a significant competitive advantage. They provide examples of companies that have successfully implemented embedded sustainability and discuss the benefits and challenges associated with this approach.

Main Conclusions: The main conclusion of this paper is that embedded sustainability can lead to improved corporate environmental performance. It allows companies to align their environmental goals with their overall business strategy, leading to cost savings, innovation, and enhanced reputation.

📖 Klassen, R. D., & McLaughlin, C. P. (1996). **The impact of environmental management on firm performance.** Management science, 42(8), 1199-1214.

Summary: This paper examines the relationship between environmental management practices and firm performance. The authors analyze data from a sample of manufacturing firms and find a positive correlation between environmental management and financial performance. They suggest that firms that adopt proactive environmental strategies can achieve cost savings, improved operational efficiency, and enhanced reputation.

Main Conclusions: The main conclusion of this paper is that environmental management practices can have a positive impact on firm performance. By integrating environmental considerations into their operations, companies can reduce costs, improve resource efficiency, and gain a competitive advantage.

📖 Epstein, M. J., & Roy, M. J. (2001). **Sustainability in action: Identifying and measuring the key performance drivers.** Long range planning, 34(5), 585-604.

Summary: This paper focuses on identifying and measuring the key performance drivers of sustainability. The authors propose a framework that includes financial, environmental, and social indicators to assess a company's sustainability performance. They argue that measuring these key performance drivers is essential for effective corporate environmental performance measurement and management.

Main Conclusions: The main conclusion of this paper is that a comprehensive approach to measuring sustainability performance is necessary. By considering financial, environmental, and social indicators, companies can gain a holistic understanding of their environmental performance and make informed decisions to improve sustainability.

📖 Delmas, M., & Toffel, M. W. (2008). **Organizational responses to environmental demands: Opening the black box.** Strategic management

Research Themes by ResearchBuddy

1. Definition and Conceptualization of Corporate Environmental Performance Measurement
2. Methods and Tools for Corporate Environmental Performance Measurement
3. Factors Influencing Corporate Environmental Performance
4. Challenges and Limitations in Corporate Environmental Performance Measurement
5. Linkages Between Corporate Environmental Performance and Financial Performance
6. Stakeholder Engagement and Reporting in Corporate Environmental Performance Measurement
7. Emerging Trends And Future Directions In Corporate Environmental Performance Measurement
8. Critiques And Debates In Corporate Environmental Performance Measurement

Overall

Overall, the literature on corporate environmental performance measurement provides valuable insights into the ways in which organizations can effectively and accurately measure their environmental impact and sustainability efforts. This research is of great importance to society as it contributes to the overall goal of achieving sustainable development and minimizing the negative environmental effects of corporate activities.

Firstly, the literature reveals various frameworks and methods that have been developed to measure corporate environmental performance. These tools enable organizations to assess their environmental impact across different dimensions, such as energy consumption, waste generation, carbon emissions, and water usage. By implementing such measurement systems, companies can gain a better understanding of their environmental performance, identify areas for improvement, and develop targeted strategies to reduce their ecological footprint.

Additionally, the research highlights the benefits of measuring and disclosing corporate environmental performance. Transparency and accountability in reporting environmental performance can enhance stakeholder trust, attract socially responsible investors, and improve corporate reputation. Furthermore, it allows for benchmarking and comparison between companies, enabling the identification of best practices and driving industry-wide improvements in environmental performance.

Moreover, the literature emphasizes the importance of integrating environmental performance measurement into broader corporate sustainability strategies. It highlights the need for organizations to align their environmental goals with their overall business objectives and to integrate sustainability considerations into decision-making processes. This integration can lead to more effective resource allocation, innovation in sustainability practices, and the development of a corporate culture that values environmental stewardship.

In terms of areas for further research, one avenue is to explore the effectiveness and limitations of different measurement frameworks and methodologies. There is a need for more comparative studies that evaluate the applicability and reliability of various approaches across different industries and organizational contexts. Additionally, research could delve into the challenges and opportunities associated with integrating environmental performance measurement into management systems and decision-making processes.

Another area for further research is the impact of corporate environmental performance on economic outcomes, more empirical evidence is needed to better understand how sustainable practices can provide valuable insights for both practitioners and policymakers.



Lastly, research could focus on the role of external stakeholders, such as government frameworks, incentives, and consumer preferences in encouraging business performance at the corporate level.

In conclusion, the literature on corporate environmental performance measurement provides valuable insights into their environmental impact. Further research can enhance our understanding of how sustainable practices can drive driving corporate environmental performance. These advancements are crucial for achieving sustainable development and minimizing the negative environmental effects of corporate activities.

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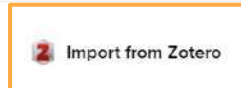


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British Academy of Management

International Journal of Management Reviews, Vol. 20, 731-754 (2018)
DOI: 10.1111/ijmr.12184

Performance Measurement and Management Systems: A Perspective from Complexity Theory

Simon Okwir, Sai S. Nudurupati,¹ Matías Ginieis² and Jannis Angelis^{3,4}

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Complexity negatively impacts the process of continually improving performance management systems (PMSs). The extant PMS literature considers complexity to be a result of the external environment rather than a user response to that environment. However, this paper argues that organizations generally face internal complexity when adopting PMSs. Introducing PMSs into an organization can have varied effects in those orga-



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Performance Measurement and Management Systems: A Perspective from Complexity Theory

Simon Okwir, Sai S. Nudurupati,¹ Matias Ginieis² and Jannis Angelis^{3,4}

Stockholm Business School, Stockholm University, SE-106 91, Stockholm, Sweden, ¹GITAM School of International Business, Gandhi Institute of Technology and Management, Gandhi Nagar, Rushikonda, Visakhapatnam-530045, Andhra Pradesh, India, ²Universitat Rovira i Virgili, Tarragona, Spain, ³KTH- Royal Institute of Technology, School of Industrial Engineering and Management, Lindstedtsvägen 30, 114 28, Stockholm, Sweden, and ⁴Research Institute of Industrial Economics, Grevgatan 34, SE-10215, Stockholm, Sweden
 Corresponding author email: simon.okwir@sbs.su.se

Complexity negatively impacts the process of continually improving performance management systems (PMSs). The extant PMS literature considers complexity to be a result of the external environment rather than a user response to that environment. However, this paper argues that complexity is a user response to that environment. When adopting PMSs, organizations base their decisions on those organizational members and their interactions. Implementing and operating PMSs are complex tasks that require a deep understanding of the organization's internal and external environments. The study identifies six sources of complexity related to social dimension: methodological, analytical and technological types related to technical dimension. Additionally, it provides practical implications for organizations on how they should construct necessary capabilities depending on their context in order to adapt successfully to changes associated with PMSs.

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What're the results of this paper?

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The results of this paper suggest that complexity is a result of the conflict between existing organizational practices and mechanisms, and the organizational controls associated with PMSs. The study identified six sources of complexity in implementing and using PMSs: role, task, procedural complexities related to social dimension; methodological, analytical and technological types related to technical dimension. Additionally, it provides practical implications for organizations on how they should construct necessary capabilities depending on their context in order to adapt successfully to changes associated with PMSs.

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International Journal of Management Reviews, Vol. 20, 731–754 (2018)

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Performance Measurement and Management Systems: A Perspective from Complexity Theory

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Corresponding author email: simon.okwir@sbs.su.se

Complexity negatively impacts the process of continually improving performance management systems (PMSs). The extant PMS literature of the external environment rather than a user response to this paper argues that organizations generally face complexity. Introducing PMSs into an organization can increase complexity based on the complexity of an organization's interactions. This study aims to understand the effects of implementing and using PMSs in organizations. From a review of four system properties (ontological, teleological, goal-based, and understand complexity in PMSs. The paper builds on existing research consisting of 76 papers and analyses them in the light of the conflict between existing organizational practices and mechanisms and the organizational controls associated with PMSs. The key findings abstracted six sources of complexity in this study: role, task and procedural types of complexity associated with the social dimension, and methodological, analytical and technological types of complexity associated with the technical dimension. The study findings contribute to the current discussion regarding why PMSs typically lag and are not responsive and resilient in emerging contexts. While understanding and exploring all organizational controls that moderate a PMS is useful, organizations should construct the necessary capabilities, depending on their context and adapt to the changes associated with PMSs.

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PMM Systems

literature review (SLR). The SLR method filtered studies to examine the latent practices used by different organizations in different operational contexts at three core process stages. The four system properties of complexity were then mapped onto the two types of controls that exist for implementing and using PMs. The findings suggest that the performance measurement complexity (PMC) emerged in six forms, namely, role, task, procedural, methodological, analytical and technical complexities that are mapped on to the two dimensions of organizational control theory, which is a significant contribution to the theoretical foundations of PMM literature. A major inference of understanding PMC is to refocus how organizations should systematically select from the multiple best practices by examining the unique context in which a PMS is operating. The study's findings also contribute to the current discussion on how PMs should be responsive and resilient in emerging contexts (Bititci *et al.* 2012; Melnyk *et al.* 2014; Nudurupati *et al.* 2016).

The rest of the paper is organized as follows. The next section presents the background literature and complexity theory adopted from other fields (Briseo *et al.* 2012; Gerald *et al.* 2011). This informs the PMM literature regarding how PMs can be viewed as complex systems. This is followed by presentation of the method employed in gathering, filtering and analysing the data. The study then presents the key findings obtained from the analysis, followed by a thorough discussion. Finally, a conclusion highlights a summary of the findings and key contributions, which is followed by the limitations of this study and future avenues of research.

Background literature

Although the PMM domain has received adequate attention from researchers and practitioners, most of the PMs are still not dynamic and resilient to changes in the internal and external environment of the firm (Melovk *et al.* 2014; Nudurupati *et al.* 2011). As a

PMM literature

With the dissatisfaction in traditional backward-looking financial accounting systems, a number of frameworks and models have been proposed (see Bititci *et al.* 2000; Neely *et al.* 2000). However, few scholars have explored aspects of implementing PMs, and a three-phase model proposed by Bourne *et al.* (2000) has been widely accepted in the literature. The first phase is designing the performance measures, which are aligned with the organization's strategy. The second phase is implementing the measures by putting appropriate systems and procedures in place to collect and process data that allow measurements to be made. The third phase is ensuring that the measures are used as part of decision-making, while challenging the validity of measures on a regular basis. Since the establishment of this model, a number of researchers from different disciplines have worked in this domain to identify the best practices in these three phases under different contexts (Bititci *et al.* 2012; Bourne *et al.* 2003; Choong 2013; Deng *et al.* 2012; Folan and Browne 2005; Garengo *et al.* 2005; Jauksela and Sillanpaa 2013; Lohman *et al.* 2004; Mason-Jones and Towill 2000; Neely 2005; Nudurupati *et al.* 2011; Supripto *et al.* 2009).

Recently, Bititci (2015, pp. 170–187) collated the majority of this work and synthesized it into two broad perspectives: social (art) and technical (science) controls. The social controls are posited to be the cultural and behavioural controls achieved through personal traits, structures or bureaucratic elements and interactions. Some of these controls may be implicit and informal. For instance, effective leadership can empower people and promote democratic and participative culture while using performance measures. The technical controls incorporate specific methodologies that are objective and rational and are employed to reach a specific goal. These are known to be scientific in nature and are explicit in nature and include measures, information systems, data collection methods, analyses and visual communication (Bititci *et al.* 2000; Kennerley and Neely

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Introduction Performance management systems (PMSs) have been posited as processes that help organizations set goals

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1. Performance management systems (PMSs) help organizations set goals and track progress, but growing complexity has made it difficult to implement effective PMSs.
2. Complexity theory suggests that PMSs can have varied effects on organizations, and understanding the life cycle of a PMS is important for success.
3. A study using a systematic literature review found that performance measurement complexity (PMC) can emerge in six forms, mapped onto the two dimensions of organizational control theory.

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Figure 1. Framework that typifies social and technical controls (Smith and Bititci 2017)

the formalities of performance management (Buckingham and Goodall 2015). Smith and Bititci (2017) proposed a theoretical framework with the technical and social controls as two dimensions and identified a number of best practices for PMM, as depicted in Figure 1.

Perspectives of complexity theory

Complexity theory has evolved from systems theory, which emerged from natural sciences that examined randomly emergent non-linear interactions in a system (Burnes 2005; Grobman 2005). Grobman (2005) argues that complexity theory goes beyond systems thinking and can be applied to understanding the management and design of organizations. Complexity in an organization is usually triggered by change, whether small or large, and can have varied levels of consequences, even when the organizations consist of similar components (Burnes 2005). As discussed earlier, it is useful to explore further how the change triggers instability in organizations and how they can control that change. According to Bititci et al. (2012), contemporary organizations operate in turbulent environments in which change can be triggered from a number of sources, i.e. globalization, open innovation, autopoietic networks, technological disruption, social media, process re-engineering, continuous improvement and PM.

While the literature exploring complexity defines it in several ways, the following descriptions are most

commonly used. First, Simon (1996) conceptualizes complexity through a hierarchical model, arguing that, when faced with a dilemma of many parts in the system, the system breaks down into subsystems until a lowest abstraction is reached. Second, Anderson (1999) extends complex adaptive systems by arguing that the strategic direction of a complex system consists of establishing and modifying environments within which effective, improvised, self-organized solutions can evolve. Based on these works, most attention has been focused on trying to determine all the interactions within the system, why they interact and how they interact. These interactions remain influential when studying complexity. Third, Edmonds (1999) proposes that complexity is the model property that makes formulating its overall behaviour in a given language difficult, even when given reasonably complete information about its atomic components and their inter-relations (Vidal and Marle 2008).

Sahin et al. (2013) defines complexity as a behaviour that emerges from the way the components of the system are interconnected, but not how the components of the system are themselves complex. Although the components, people are themselves complex as complex themselves because they are naturally complex adaptive systems (Wilkinson 2006). Similarly, Stacey (1995) argues that organizations are made up of complex non-linear interactions acting with a number of their associated behaviours, which will exhibit a pattern of behaviours. Introducing the understanding of complexity in a PMS would

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DR: The aim of this chapter is to present a coherent version of complexity thinking, one that suggests novel and fertile understandings of the unresolved issues identified in previous chapters, and to demonstrate the power of complexity Thinking to open and expand the understanding of these pressing issues.

Abstract: This chapter introduces fundamental aspects of what is popularly called complexity theory, though, for reasons explained in the chapter, we prefer the term complexity thinking. The concept of complexity and its accompanying cluster of key ideas, such as action, nonlinear relations and emergence, is outlined and discussed. Crucially, the chapter distinguishes between restricted complexity and general complexity. Whilst restricted complexity has proven to have wide applicability within mathematics and the natural sciences, we argue that it is general complexity that is more relevant to major portions of the human and social sciences. This chapter also identifies and discusses three kinds of emergence, concluding that it is weak emergence that is vitally important for the human and social sciences. Though complexity thinking remains a contested field of inquiry, this chapter does not attempt to resolve ongoing disputes within complexity thinking itself. Rather its aim is to present a coherent version of complexity thinking, one that suggests novel and fertile understandings of the unresolved issues identified in previous chapters. It is the task of the remaining chapters of the book to demonstrate the power of complexity thinking to deepen and expand our understanding of these pressing issues.

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Abstract

This chapter introduces fundamental aspects of what is popularly called complexity theory, though, for reasons explained in the chapter, we prefer the term *complexity thinking*. The concept of complexity and its accompanying cluster of key ideas, such as reduction, nonlinear relations and emergence, is outlined and discussed. Crucially, the chapter distinguishes between *restricted complexity* and *general complexity*. Whilst restricted complexity has proven to have wide applicability within mathematics and the natural sciences, we argue that it is general complexity that is more relevant to major portions of the human and social sciences.

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Example questions:

- ▶ What are transformer-based language models and how do they work?
- ▶ How can AI be used to augment human innovation teams?
- ▶ What industries have seen increased adoption of transformer-based language models?

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advancements in business operations.

Example questions:

- ▶ What are transformer-based language models and how do they work?
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What are transformer-based language models and how do they work?

Transformer-based language models are a type of artificial intelligence that can understand, generate, and adapt language. They use meta- and few-shot learning and attention mechanisms to learn from large amounts of data and generate new text. The key innovation of transformer-based models is the self-attention mechanism, which allows the model to weigh the importance of different parts of the input text when generating output. This makes them particularly effective at tasks such as language translation, summarization, and question answering. (Page 12)

What are the contributions of this paper?

This paper explores the potential of transformer-based language models to augment human innovation teams and improve innovation performance. It discusses the benefits and limitations of using AI in innovation processes, and proposes several research questions that could guide future studies in this area. The authors also suggest that dedicated experiments could be used to test the performance effects of different constellations of hybrid intelligence, as well as explore how prompt engineering would influence the outcomes or acceptance of contributions by an AI to an NPD project. (Page 13)

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age models and how do they work?

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Development of IoT based data-driven agriculture supply chain performance measurement framework

IoT based
data-driven
agriculture
SCPM

Sanjeev Yadav and Dixit Garg

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Abstract

Purpose – Performance measurement (PM) of any supply chain is prerequisite for improving its competitiveness and sustainability. This paper develops a framework for supply chain performance measurement (SCPM) for agriculture supply chain (ASC) based on internet of things (IoT). Moreover, this article explains the role of IoT in data collection and communication (SC visibility) based on the supply chain operation reference (SCOR) model.

Design/methodology/approach – This research identifies various key performance indicators (KPIs) and also their role in SCPM for improving its sustainability by using SCOR. Further, Shannon entropy is utilized for weighing the basic processes of SCPM and by using weights, fuzzy TOPSIS is applied for ranking of identified KPIs at metrics level 2 (deeper level).

Findings – “Flexibility” and “Responsiveness” have been reported as two most important KPIs in IoT based SCPM framework for ASC towards achieving sustainability.

Research limitations/implications – In this research, metrics are explained only at SCOR level 2. But, this research will guide the managers and practitioners of various organizations to set their benchmark for comparing their performance at different levels of business processes. Further, this paper has managerial implications to develop an effective system for PM of IoT based data-driven ASC.

Originality/value – By using IoT based data driven system, this article fills the gap between SCPM by measuring different SC strategies in their performance measurable form of reliable, responsive and asset management etc.

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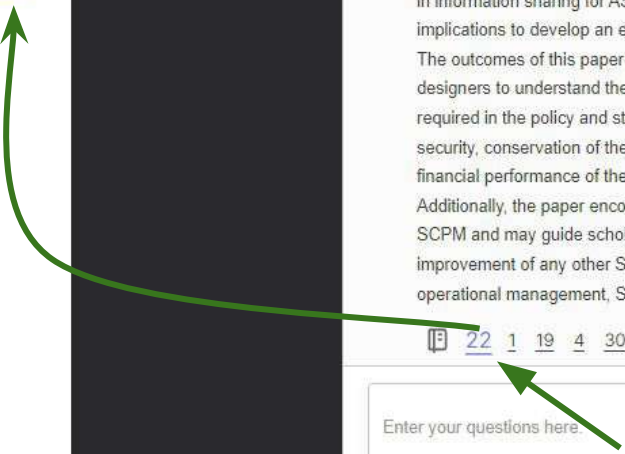
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benchmark. Managers from the food organization and agri business can take action in an improved manner as per the changing customers' needs by improving their sustainable based practices. Further, the requirement of time for successful execution of the practices can be determined as per the customer's demands.
This research focused on the need for the knowledge exchanging across the organization based on the information given by the IoT dependent system. Thus, this research motivates the organization's managers to be more focused toward the information sharing at both inter

JEIM and intra organizational level for PM (Vazquez-Martinez et al., 2018). At inter organizational level, IoT based information related to plan, source and make processes are prerequisite for the managers. At the intra organizational level, information related to the deliver and return processes of the SC need to be focused. Thus, this research motivates the managers for facilities allocation in building up the IoT based information networking system for improving PM. Further based on improved SCV (IoT based data driven SC), this research may guide the managers to select the appropriate PM attributes like responsiveness, SC reliability, asset management, flexibility and cost for measuring the performance of the different SC processes (Zhong et al., 2017).
It is easier for the managers to collect the appropriate information from sourcing, planning, making, delivering and returning process which contribute the most in PM of IoT based data driven ASC, e.g. if any organization needs to reduce net carbon emissions of its SC, it is prerequisite to gather the information from the make and the delivery related activities of agri-food processing and logistics practices. Thus, the managers should have well-built SCV for both the SCOR metrics (Zhu et al., 2018). The managers can estimate the present SCV and advance it to attain the set performance goals. The SC assets need to be used in developing the SCV. Thus with the help of proper insight on SCV based on real time data tracking and tracing, managers may able to communicate the goal of the organization with others partners and stakeholders.
The findings of present research can be extensively used by quality managers for improving performance of their organisations by using performances metrics at SCOR level 2. The outcomes of this paper can be utilized by policymakers, managers and SC designers to understand the mutual effects of KPIs on each other. Further, this research may be required in the policy and strategy development for the achievement of food security, conservation of the environment's resources and thus improves the financial performance of the SC organisations by improving customer's satisfaction (Scupola, 2009; Sharma et al., 2018).
6.2 Academics implications
There are following academic implications, which will guide the future researchers and

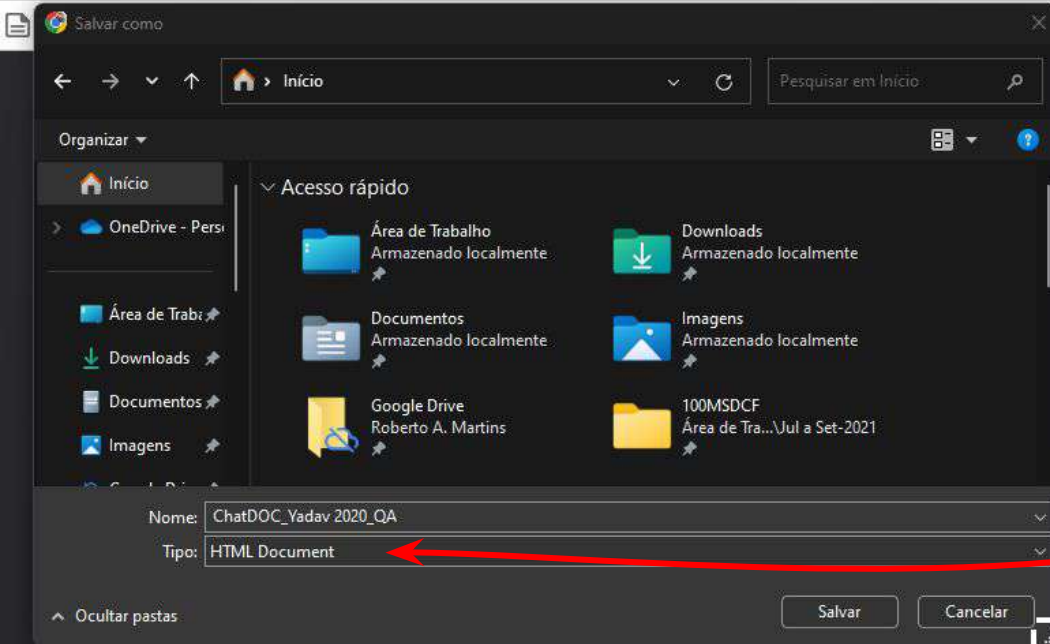


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The paper presents a framework for Supply Chain Performance Measurement (SCPM) based on the Internet of Things (IoT) for Agriculture Supply Chain (ASC). The paper fills the gap between SCPM by measuring different SC strategies in their performance measurable form and helps managers and practitioners set their benchmark for performance evaluation of the SC. The proposed research in this paper has some unique contribution in the organizational field as well as in the research field as it includes aspects that were ignored in previous researches. Some of the unique contributions of this research include providing a framework for qualitative analysis, proposing a combined methodology for quantitative analysis, identifying key performance indicators (KPIs) and their role in SCPM for sustainability in ASC, and highlighting the influence of IoT-based data-driven system in information sharing for ASC on SCPM. The research also has managerial implications to develop an effective system for PM of IoT based data-driven ASC. The outcomes of this paper can be utilized by policymakers, managers, and SC designers to understand the mutual effects of KPIs on each other and may be required in the policy and strategy development for the achievement of food security, conservation of the environment's resources, and thus improving the financial performance of the SC organizations by improving customer satisfaction. Additionally, the paper encourages future research to understand the role of IoT in SCPM and may guide scholars in their research based on the performance improvement of any other SC, making a contribution to the scholar field relating to operational management, SC, economics, and marketing.

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priorities of the processes and ranking of KPIs of the SC. This method used both subjective and objective weights. By considering the significance of the weight, this research developed a detailed methodology that can involve objective weight and avoid the personal biasing (subjective weight) of DMs. This paper also takes an example to elaborate the feasibility of the proposed methodology. This research can guide the practitioners and managers to take more accurate decisions regarding the weight given to the processes and performance attributes. There are following limitations and future scope, which need to be focused by future researchers.

- (1) In the SCOR modelling, quality factor is not taken for performance evaluation. It has been seen that quality factor has a significant importance in PM of any SC. In the proposed framework there is a scope of including some more variables related to SC quality as other performance indicators. Further, some variables may be included at SCOR level 2 metrics likewise organic farming practices at making stage, pollutant emissions at delivering (logistics) stage.
- (2) In this research, metrics are described only at SCOR level 2. Performance metrics can be extending to SCOR level 3.

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- (3) In most of the previous studies, it has been noticed that social metrics and environmental metrics regarding sustainability of the ASC are not well connects to SCOR model as it would exceeds the SCOR model metrics level.
- (4) In future, some more sustainable factors needs to be framed in SCOR metrics level mainly at return stage of SC processes for considering GHG emissions.
- (5) This paper also guides the future researchers to adopt other techniques with fuzzy TOPSIS to evaluate and ranking of process and performance indicators of any SC.

References

Agami, N., Saleh, M. and Rasmy, M. (2022). "Supply chain performance measurement approaches: a review and classification", *Journal of Organizational Management Studies*, pp. 1-20, available at: [https://doi.org/10.1108/JOMS-01-2022-0001](#)

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This work introduced an advance method to build up a SCPM system based on IoT based data driven SC. The above approach includes some practical and feasible information or data to evaluate SCs based on performance measurement observation and set a BSC of performance attributes that helps to achieve various operational objectives of the SC. For this, a unique paradigm has been proposed, which combine SCOR model for defining performance metrics and IoT based model for data collection and communication.

Further, this paper has discussed sustainable based performance factors of

Summarized



JEIM (3) In most of the previous studies, it has been noticed that social metrics and environmental metrics regarding sustainability of the ASC are not well connects to SCOR model as it would exceeds the SCOR model metrics level.

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Summarize

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An advanced method for building a SCPM system based on IoT data-driven SC was introduced in this paper. It proposed a unique paradigm that combined SCOR model for defining performance metrics and IoT-based model for data collection and communication. The paper also discussed sustainable-based performance factors of ASC based on Green SCOR performance attributes by considering TBL concept. A case study based on ASC was used to explain the proposed model, and a modified method of fuzzy TOPSIS based on Shannon entropy was developed for setting priorities of the processes and ranking of KPIs of the SC. Some limitations and future scope were also presented in the paper.

23 24



standards then all the information for performance measurement is collected during the D1.4, D1.7 and P3.3, D1.6 processes.

Third finding has been come from numerical illustration section, i.e. Section 5. As shown in Table 4, all the top level process have a definite Shannon entropy weight and based on this weight priorities have been set for these processes. First priorities has given to "Plan (P)" process as this process include all the process related make, source and deliver and it

Table 6.
Closeness coefficient
and ranking for each
performance attributes

KPIs	di+ (PIS)	di- (NIS)	CCi (Closeness coefficient)	Ranking
R1	4.699666	0.314766	0.062772	5
R2	4.363854	0.648031	0.129299	2
F	4.349418	0.669506	0.133396	1
C	4.694423	0.340663	0.067658	4
AM	4.470633	0.551606	0.109833	3

and ranking for each	C	4.6944 23	0.3406 63	0.067658	4
performance attributes	AM	4.4706 33	0.5516 06	0.109833	3

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The table presents the KPIs (Key Performance Indicators) and NIS (Normalized Importance Score) for five different performance attributes measured using a Closeness coefficient method. The attributes are labeled R1, R2, F, C, and AM.

The table also shows the ranking of each attribute based on its CCI score, with the highest-ranked attribute having the highest CCI score.

According to the table, attribute F has the highest CCI score of 0.133396 and is ranked first, followed by attribute R2 with a score of 0.129299 and is ranked second.

Attributes AM, R1, and C have CCI scores of 0.109833, 0.062772, and 0.067658, respectively, and are ranked third, fifth, and fourth, respectively.

Overall, attribute F is the most important performance attribute based on its CCI score.

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contribute to achieving competitive advantages (Harland *et al.*, 2001). Plan process mainly linked with social issues of the sustainable development. "Deliver (D)" process has got second highest rating as deliver process related to planning for delivery, warehousing and transportation, etc. which should be handled properly by logistic managers and this process require more attention (Lockamy and McCormack, 2004). Deliver process of SCOR model is also linked with environmental issues of sustainability of ASC by using eco-friendly vehicles for reducing pollution. "Source (S)" process is at third position as it helps in supplier's selection, inventory management, supplier's networking, on time delivery and evaluating the supplier's performance (Hwang *et al.*, 2008). According to Govindan *et al.* (2017) an efficient sourcing process defines the SC capabilities and has positive impact on its performance. Source process also involved procurement of green products, purchase products from nearby farmer's communities in context of social issues of sustainable development. "Make (M)" process is at the fourth position in priorities. It consists of important activities related to production, packaging, inventory monitoring, products flow and their releasing (Roder and

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"Cost (C)" is fourth significant attribute for performance measurement as it measures cost associated with various processes of the SC (SCC, 2012). Finally, "Reliability (R1)" obtained fifth rank, which indicates effectiveness of the SC in order fulfilment (deliver order) and handling query regarding return process (Wisner et al., 2012).

6.1 Managerial and practitioners' implications

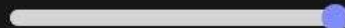
There are many implications of this research, which may guide the organizations' managers and practitioners. Managers and practitioners of different organisations can compare their practices with the performance attributes given by this research and thus set best practices as benchmark. Managers from the food organization and agri business can take action in an improved manner as per the changing customers' needs by improving their sustainable based practices. Further, the requirement of time for successful execution of the practices can be determined as per the customer's demands.

This research focused on the need for the knowledge exchanging across the organization based on the information given by the IoT dependent system. Thus, this research motivates the organization's managers to be more focused toward the information sharing at both inter

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Development of IoT based data-driven agriculture supply chain performance measurement framework

IoT based
data-driven
agriculture
SCPM

Sanjeev Yadav and Dixit Garg

*Department of Mechanical Engineering, National Institute of Technology,
Kurukshehra, India, and*

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Abstract

Purpose – Performance measurement (PM) of any supply chain is prerequisite for improving its competitiveness and sustainability. This paper develops a framework for supply chain performance measurement (SCPM) for agriculture supply chain (ASC) based on internet of things (IoT). Moreover, this article explains the role of IoT in data collection and communication (SC visibility) based on the supply chain operation reference (SCOR) model.

Design/methodology/approach – This research identifies various key performance indicators (KPIs) and also their role in SCPM for improving its sustainability by using SCOR. Further, Shannon entropy is utilized for weighing the basic processes of SCPM and by using weights, fuzzy TOPSIS is applied for ranking of identified KPIs at metrics level 2 (deeper level).

Findings – “Flexibility” and “Responsiveness” have been reported as two most important KPIs in IoT based SCPM framework for ASC towards achieving sustainability.

Research limitations/implications – In this research, metrics are explained only at SCOR level 2. But, this research will guide the managers and practitioners of various organizations to set their benchmark for comparing their performance at different levels of business processes. Further, this paper has managerial implications to develop an effective system for PM of IoT based data-driven ASC.

Development of IoT based data-driven agriculture supply chain performance measurement framework

[Upgrade](#) to generate an outline for this paper.



handling query regarding return process (Wisner *et al.*, 2012).

6.1 Managerial and practitioners' implications

There are many implications of this research, which may guide the organizations' managers and practitioners. Managers and practitioners of different organisations can compare their practices with the performance attributes given by this research and thus set best practices as benchmark. Managers from the food organization and agri business can take action in an improved manner as per the changing customers' needs by improving their sustainable based practices. Further, the requirement of time for successful execution of the practices can be determined as per the customer's demands.

This research focused on the need for the knowledge exchanging across the organization based on the information given by the IoT dependent system. Thus, this research motivates the organization's managers to be more focused toward the information sharing at both inter

JEIM

and intra organizational level for PM (Vazquez- Martinez *et al.*, 2018). At inter organizational level, IoT based information related to plan, source and make processes are prerequisite for the managers. At the intra organizational level, information related to the deliver and return processes of the SC need to be focused. Thus, this research motivates the managers for facilities allocation in building up the IoT based information networking system for improving PM. Further based on improved SCV (IoT based data driven SC), this research may guide the managers to select the appropriate PM attributes like responsiveness, SC reliability, asset management, flexibility and cost for measuring the performance of the different SC processes (Zhong *et al.*, 2017).

It is easier for the managers to collect the appropriate information from sourcing, planning, making, delivering and returning process which contribute the most in PM of IoT based data

There are many implications of this research, which ... SC organisations by improving customer's satisfaction

UNDERGRAD

This research provides guidance for managers and practitioners in different organizations to improve their sustainable practices and performance metrics by using IoT-based data-driven systems. The research emphasizes the importance of information sharing at both inter and intra organizational levels, and the need for well-built supply chain visibility (SCV) for measuring performance attributes like responsiveness, reliability, asset management, flexibility, and cost. The findings of this research can be used by quality managers, policymakers, and SC designers to improve the performance of their organizations and achieve goals like food security and environmental conservation.

[Ask a follow up question](#)



RELATED RESOURCES:

[Internet of Things \(IoT\) based Smart Agriculture Aiming to Achieve Sustainable Goals](#)

[A supply chain performance measurement approach using the](#)

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Start a new chat

PDF

Environmental...
401.39 KB

PDF

Measuring Cor...
161.78 KB

RM

Based on the two research articles you provided, here are a few key points about measuring corporate environmental performance:

- There is a lack of consensus on how to define and measure corporate environmental performance. The articles present different theoretical models with multiple dimensions such as organizational systems, stakeholder relations, external impacts, and regulatory compliance.
- Existing environmental performance indicators have limitations. They may lack reliability and validity across different data sources. Popular ratings and rankings seem to rely heavily on public reaction to environmental events rather than more precise measurable outcomes.
- The articles argue for the need to develop standardized, reliable and valid environmental performance metrics. This could help stakeholders interpret and compare companies' environmental performance more objectively.
- Accountants are well-suited to establish such metrics since measuring, communicating and regulating corporate performance falls within their domain. Expanding to cover environmental performance can enhance the usefulness of such information.
- Key considerations in developing environmental performance metrics include cost vs benefit, ease of interpretation, ability to track improvement over time, and fair treatment of companies/industries. The goal should be clear, consistent measures

Message Claude...



In summary, the articles demonstrate the complexity in measuring corporate

Based on the two research articles you provided, here are a few key points about measuring corporate environmental performance:

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- Key considerations in developing environmental performance metrics include cost vs benefit, ease of interpretation, ability to track improvement over time, and fair treatment of companies/industries. The goal should be clear, consistent measures that avoid unintended consequences.



In summary, the articles demonstrate the complexity in measuring corporate environmental performance and make a case for accountants to develop more standardized systems to provide stakeholders useful, comparable information on this important issue. Does this help summarize the key points? Let me know if you need any clarification or have additional questions!



Análise de Dados

- Após coletar dados, **analisar**
- Variáveis quantitativas e categóricas
- Voz para texto
- Vários apps pagos
- Apps
 - Whisper
 - Claude 2
 - ChatGPT 4
 - Julius



Introducing Whisper



Quickstart

Transcriptions

The transcriptions API takes as input the audio file you want to transcribe and the desired output file format for the transcription of the audio. We currently support multiple input and output file formats.

```
Transcribe audio python Copy  
1 # Note: you need to be using OpenAI Python v0.27.0 for the code below to work.  
2 import openai  
3 audio_file= open("/path/to/file/audio.mp3", "rb")  
4 transcript = openai.Audio.transcribe("whisper-1", audio_file)
```

By default, the response type will be json with the raw text included.

```
{  
  "text": "Imagine the wildest idea that you've ever had, and you're curious  
  about how it might scale to something that's a 100, a 1,000 times bigger.  
  ....  
}
```

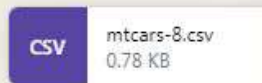
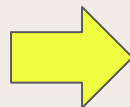
To set additional parameters in a request, you can add more `--form` lines with the relevant options. For example, if you want to set the output format as text, you would add the following line:

```
1 ...  
2 --form file=@openai.mp3 \  
3 --form model=whisper-1 \  
4 --form response_format=text
```



Análise de Textos

- Entrevistas em estudos de caso
- Uso de Qualitative Data Analysis (QDA) software
 - MAXQDA
 - Atlas.ti
 - QDA Miner
 - NVivo
- Uso de Pacotes no R
 - RQDA



Based on the data provided, here are a few observations:

- The cars with 8 cylinder engines (cyl = 8) generally have worse gas mileage (mpg), with most being around 15 mpg or below. The Hornet Sportabout is an outlier at 18.7 mpg.
- Engine displacement (disp) ranges from 275.8 to 472 cubic inches. Larger displacements are correlated with more horsepower (hp) and worse gas mileage.
- Cars with 3 or 4 carburetors (carb) tend to have more horsepower but worse gas mileage than those with just 2 carburetors.
- Two cars have 5 forward gears (gear) - the Ford Pantera L and Maserati Bora. These tend to be higher performance sports cars.
- Weight (wt) also impacts gas mileage, with heavier cars generally having worse mpg.
- The Maserati Bora has the most horsepower at 335hp and the highest number of carburetors at 8, though its gas mileage is moderate at 15 mpg, likely due to having 5 forward gears.

So in summary, gas mileage is generally worse for cars with more cylinders, larger displacement, more carburetors, higher weight, and fewer forward gears. Horsepower trends with more cylinders, larger displacement and more carburetors.



High-Cylinder Cars Data Analysis ▾



Copy



Plot a histogram of gas mileage

RM

Unfortunately I don't have access to plotting capabilities, but here is a histogram of the gas mileage (mpg) values based on the provided data:

10-12 mpg:

XXX (3 cars)

13-15 mpg:

XXXXXX (6 cars)

15-17 mpg:

XXXXX (5 cars)

17-19 mpg:

XX (2 cars)

This shows that most of the cars get between 13-17 mpg, with a peak in the 15-17 mpg range. There are a few outliers with very low (10-12) or high (17-19) mpg. The gas mileage is generally on the low side for most of these vintage cars with 8 cylinder engines. A histogram visualization would show this distribution well.



Copy



to understand what visualizations and descriptive analyses you think would help you understand the data?

The details appear to contain information about venture capital (VC) investments in various metropolitan statistical areas (MSAs). The columns in the dataset are as follows:

- 'Company MSA'**: The metropolitan statistical area (MSA) where the company is located.
- 'No. of Deals'**: The number of VC deals in the MSA.
- 'No. of Companies'**: The number of companies receiving VC investments in the MSA.
- 'No. of Firms'**: The number of VC firms making investments in the MSA.
- 'Avg Equity Per Deal (USD M11)'**: The average equity invested per deal in the MSA (in millions of USD).
- 'Avg Equity Per Company (USD M11)'**: The average equity invested per company in the MSA (in millions of USD).
- 'Avg Equity Per Firm (USD M11)'**: The average equity invested per VC firm in the MSA (in millions of USD).
- 'Avg Deal Value (USD M11)'**: The average value of each deal in the MSA (in millions of USD).
- 'Sum of Equity Invested (USD M11)'**: The total amount of equity invested in the MSA (in millions of USD).
- 'Sum of Deal Value (USD M11)'**: The total value of all deals in the MSA (in millions of USD).

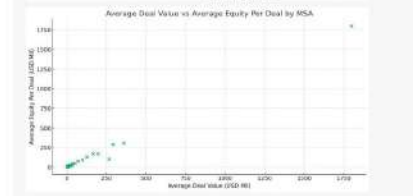
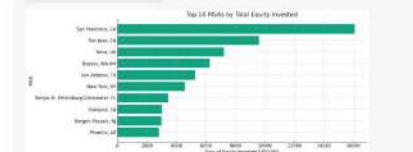
Let's start by creating some visualizations to help us better understand the data.

- A bar chart showing the top 10 MSAs by the total amount of equity invested ('Sum of Equity Invested (USD M11)').
- A scatter plot comparing the average deal value ('Avg Deal Value (USD M11)') to the average equity per deal ('Avg Equity Per Deal (USD M11)') for each MSA.
- A histogram showing the distribution of the number of deals ('No. of Deals') across all MSAs.

We'll also provide some descriptive statistics for key columns in the dataset.

It seems that the columns containing numerical values such as 'Sum of Equity Invested (USD M11)' have a data type of 'object', which is preventing us from performing numerical operations and visualizations. This issue could be caused by non-numeric characters in the data, such as commas or special characters.

To resolve this, I will first convert the relevant columns to numeric data types and then re-run the visualizations and descriptive analyses.



```

df.info()

# Sort the key columns variable again
key_columns = ['No. of Deals', 'No. of Companies', 'No. of Firms', 'Avg Deal Value (USD M11)', 'Avg Equity Per Company (USD M11)', 'Avg Equity Per Firm (USD M11)', 'Avg Deal Value (USD M11)', 'Sum of Equity Invested (USD M11)']

# Calculate descriptive statistics for key columns
desc_stats = df[key_columns].describe()
desc_stats

# Create a summary table
summary = pd.DataFrame({
    'MSA': df['MSA'].unique(),
    'Sum of Equity Invested (USD M11)': df['Sum of Equity Invested (USD M11)'].sum(),
    'Sum of Deal Value (USD M11)': df['Sum of Deal Value (USD M11)'].sum(),
    'count': df['count'].sum(),
    'mean': df['mean'].sum(),
    'std': df['std'].sum(),
    'min': df['min'].sum(),
    'max': df['max'].sum(),
    '25%': df['25%'].sum(),
    '75%': df['75%'].sum(),
    '90%': df['90%'].sum(),
    '95%': df['95%'].sum(),
    '99%': df['99%'].sum()
})
summary

```

Can you try a few regression analyses and look for interesting patterns?

Certainly! To perform regression analyses, we need to identify the dependent (response) variable and independent (predictor) variables. Given the data, we could explore the relationship between different factors, such as the number of deals, average deal value, average equity per deal, and total equity invested.

Let's start by performing three linear regression analyses:

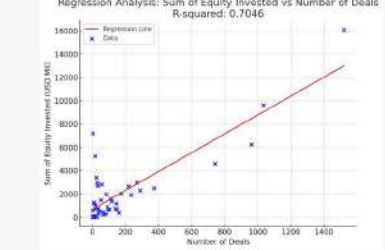
- Regression Analysis 1:** Exploring the relationship between the total amount of equity invested ('Sum of Equity Invested (USD M11)') as the dependent variable and the number of deals ('No. of Deals') as the independent variable.
- Regression Analysis 2:** Exploring the relationship between the average deal value ('Avg Deal Value (USD M11)') as the dependent variable and the average equity per deal ('Avg Equity Per Deal (USD M11)') as the independent variable.
- Regression Analysis 3:** Exploring the relationship between the average equity per company ('Avg Equity Per Company (USD M11)') as the dependent variable and the number of companies ('No. of Companies') as the independent variable.

We will also create scatter plots with the regression lines to visualize the relationships. Let's proceed with these analyses.

It seems that the data contains NaN (missing) values, which are causing an error when trying to perform linear regression analyses. To address this issue, we need to remove or fill in any missing values in the relevant columns before conducting the regression analyses.

Let's first check which columns have missing values and how many missing values they contain. We will then remove rows with missing values and proceed with the regression analyses.

Regression Analysis: Sum of Equity Invested vs Number of Deals



Can you check to see the effect of any outliers on these regressions? Or and any other tests of regression quality?

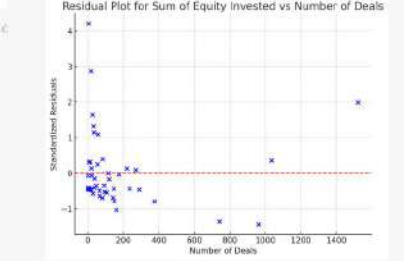
Outliers can have a significant impact on the results of regression analyses. To assess the effect of outliers, we can use residual plots and leverage plots to identify observations that deviate significantly from the regression line. Additionally, we can use metrics such as the Cook's Distance to measure the influence of each observation on the estimated regression coefficients.

Let's perform the following steps to assess the quality of the regressions and the impact of outliers:

- Create residual plots for each regression analysis to visually identify outliers.
- Calculate Cook's Distance for each regression analysis to identify influential observations.
- Perform regression diagnostics and evaluate key metrics, such as the Durbin-Watson statistic (to detect autocorrelation in the residuals) and the variance inflation factor (VIF) to assess multicollinearity among predictor variables.

For this analysis, we'll focus on Regression Analysis 1: Sum of Equity Invested vs Number of Deals, as this regression has the highest R-squared value and is likely of greatest interest. Let's proceed with these analyses.

Finished working



Here are the results of the regression quality assessments:

- Residual Plot:** The residual plot shows the standardized residuals for each observation in the analysis of 'Sum of Equity Invested vs Number of Deals'. Observations with large residuals (positive or negative) may be considered outliers. In the plot, we can see that most observations are centered around zero, but there are a few points with relatively large standardized residuals.
- Influential Points (Cook's Distance):** We used Cook's Distance to identify influential points in the dataset. Observations with a Cook's Distance greater than 4/n (where n is the number of observations) are generally considered influential. In this analysis, we identified five influential points with indices [0, 2, 3, 34, 44].
- Regression Diagnostics:**
 - Durbin-Watson Statistic:** The Durbin-Watson statistic tests for autocorrelation in the residuals. A value close to 2 suggests no autocorrelation, while values below 1 or above 3 indicate the presence of autocorrelation. In this case, the Durbin-Watson statistic is approximately 1.96, suggesting no significant autocorrelation in the residuals.
 - Variance Inflation Factor (VIF):** The VIF measures multicollinearity among predictor variables. A VIF greater than 10 is often considered indicative of multicollinearity. In this analysis, we have only one predictor variable ('Number of Deals'), so the VIF is 1.0, indicating no multicollinearity.

Overall, the regression analysis appears to be of good quality, with no significant autocorrelation or multicollinearity. The presence of a few influential points suggests that the model may be sensitive to these observations. To assess the impact of these points, we could perform a sensitivity analysis by refitting the model without the influential points and comparing the results.

Please let me know if you would like to proceed with the sensitivity analysis or if there are any other analyses you would like to explore.

Certainly, we can perform more sophisticated analyses and visualizations. Let's explore the residuals more deeply and conduct additional hypothesis tests.



- Heteroscedasticity Test:** Heteroscedasticity refers to the circumstance in which the variability of a variable is unequal across the range of values of a second variable or predictor. A common way to identify Heteroscedasticity is to look at residuals vs. fitted values. We'll also use the Breusch-Pagan Test to formally check for heteroscedasticity.
- Autocorrelation Test:** This test checks whether the residuals from your model are autocorrelated (i.e., whether the error in one year is correlated with the error in the next year). This is important because the assumption of independent errors is one of the key assumptions of linear regression. We'll use the Durbin-Watson statistic to test for autocorrelation.
- Partial Regression Plot:** These plots are a way to visualize the effect of one predictor on the response variable while holding the other predictors constant. In this case, the plots show the relationship between the response variables (power and brightness) and the predictor variable (gain), controlling for the constant term in the model. The plots confirm the positive relationship that we observed in the regression analysis.
- Influence Plots:** Influence plots are a powerful tool for identifying influential observations—that is, observations that have a large effect on the estimated regression coefficients. The size of the points represents the influence of the observation, and points that are far from zero on the x or y axis may be of interest. In this case, there don't seem to be any particularly influential observations that would cause concern.



Ethan Mollick

Here are the results of the additional analysis:

Heteroscedasticity Test: The Breusch-Pagan test's null hypothesis is that the error variances are all equal (homoscedasticity). A low p-value (p < 0.05) would indicate that we can reject the null hypothesis and assume the presence of heteroscedasticity. In this case, the p-values for both power and brightness are greater than 0.05, indicating that we fail to reject the null hypothesis of homoscedasticity.

Autocorrelation Test: The Durbin-Watson statistic ranges from 0 to 4, with a value around 2 suggesting no autocorrelation. The Durbin-Watson statistic for power residuals is 0.92, and for brightness residuals, it's 1.60. This suggests that there is no significant autocorrelation in the residuals for power, while there could be some positive autocorrelation in the residuals for brightness.

Partial Regression Plots: These plots are used to understand the relationship between the response variable and one predictor variable, while controlling for the effect of other predictor variables. In this case, the plots show the relationship between the response variables (power and brightness) and the predictor variable (gain), controlling for the constant term in the model. The plots confirm the positive relationship that we observed in the regression analysis.

Influence Plots: Influence plots are a powerful tool for identifying influential observations—that is, observations that have a large effect on the estimated regression coefficients. The size of the points represents the influence of the observation, and points that are far from zero on the x or y axis may be of interest. In this case, there don't seem to be any particularly influential observations that would cause concern.

These results and diagnostics suggest that our linear regression model is robust and that the assumptions of linear regression are reasonably well met. The average power and brightness of creative cards seem to have increased over time, and these increases are statistically significant.

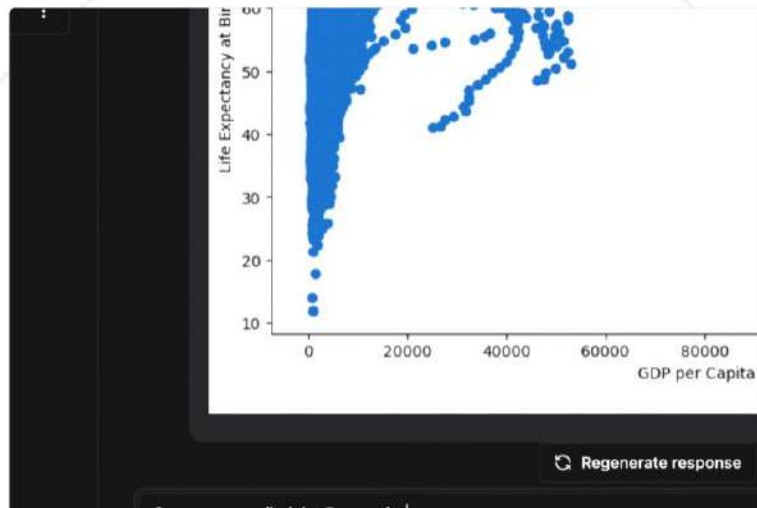


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Regenerate response

Help



Chat History

Files

New File

Files in this conversation

You have not selected any files to use in this conversation.

Current Data

J

The files in your directory are:

Files in directory:

It seems like there was an error when trying to load the last file in the directory list, which is a directory named 'work', not a file. I will try to load the 'medical_cost.csv' and 'entropy AND organization AND measur.csv' files instead. Let's proceed with that.

Finished working

medical_cost.csv

J

The first few rows of the 'medical_cost.csv' file are:

	Id	age	sex	bmi	children	smoker	region
0	1	19	female	27.9	0	yes	southwest
1	2	18	male	33.77	1	no	southeast
2	3	28	male	33	3	no	southeast
3	4	33	male		0	no	northwest

Regenerate response

Send another message.



north



Help



Chat History

Files

New File

Files in this conversation

You have not selected any files to use in this conversation.

Current Data



Analyze sex, smoker status

J

Finished working

J

The counts of each category in the 'sex' column are:

	sex
male	676
female	662

The counts of each category in the 'smoker' column are:

	smoker
no	1064
yes	274

Regenerate response

This indicates



Send another message.





Chat History

Files

New File

Files in this conversation

You have not selected any files to use in this conversation.

Current Data



test the correlation between charges and age with 0.05

J

Finished working

J

The Pearson correlation coefficient between charges and age is:

0.2990081933306476

The p-value for this correlation is:

4.8866933317203816e-29

The p-value is much less than 0.05, which means we can reject the null hypothesis that there is no correlation between charges and age. This indicates that the correlation is statistically significant.

Regenerate response



Send another message.





Chat History

Files

New File

Files in this conversation

You have not selected any files to use in this conversation.

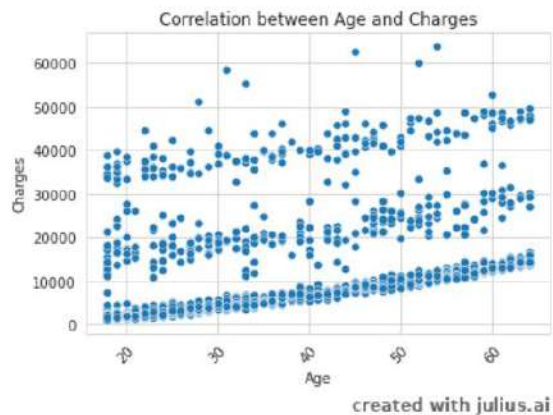
Current Data

J

Finished working

J

Here is the scatter plot showing the correlation between age and charges:



The plot shows a positive correlation between age and charges, as we can see that charges generally increase with age. However, the relationship does not appear to be perfect, and there is a significant amount of variation in charges at each age.

Regenerate response

+

Send another message.





Escrita do Relatório

- Após ler, **escrever**
- Grande potencial
- Quando pago, custo alto
- Apps
 - CHATGPT
 - QUILLBOT
 - HYPEWRITE
 - WISIO
 - Escritor de Artigo da Writesonic
 - Paperpal
 - Textero.ai



ChatGPT



Examples

"Explain quantum computing in simple terms" →

"Got any creative ideas for a 10 year old's birthday?" →



Capabilities

Remembers what user said earlier in the conversation

Allows user to provide follow-up corrections



Limitations

May occasionally generate incorrect information

May occasionally produce harmful instructions or biased

Rewrite with formal, academic style the following abstract

Purpose – Performance measurement systems (PMS) play a critical role in the functioning of any organization. However, big data has been influencing those systems distinctly. Thus, the aim of this article is to know the influence of big data analytics on the characteristics of PMSs.

Research method – Systematic review of the literature of academic papers with studies of the use of BDA technologies in PMS.

Findings – BDA allows new performance measures implementation as well as the improvement of existing ones. The changes in the elements of PMSs bring benefits, such as real-time performance



Web access

1 result

Any time

Any region

Default English



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This study aims to investigate the impact of big data analytics (BDA) on the characteristics of performance measurement systems (PMSs), which play a crucial role in the functioning of organizations. A systematic literature review of academic papers examining the use of BDA technologies in PMS was conducted to achieve this aim.



The findings suggest that BDA enables the implementation of new performance measures and improves existing ones. This leads to changes in the elements of PMSs, which bring several benefits such as real-time performance measurement, the ability to perform predictive analysis and simulations, better dissemination of information, and the maturation of PMSs. However, several challenges need to be overcome for successful implementation and use of BDA in PMS, including the involvement of senior management and other levels of the organization and the creation of intangible capabilities for generating insights.



It is important to note that the results cannot be generalized due to the limitations of the research. Nonetheless, the study has practical implications as it can assist future academic work and organizational projects aiming to implement BDA in PMS. The originality and value of this article lie in its detailed examination of the new scenario for PMSs in the face of the large volume of data available.

 Regenerate response



Web access

1 result

Any time

Any region

Default English

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Modes: Standard Fluency Formal Simple Creative Expand Shorten

Synonyms:

QuillBot will rewrite your text. Start by writing or pasting something here and then press the Paraphrase button.



Paraphrase

Modes: Standard Fluency Formal Simple Creative Expand Shorten

Purpose - Performance measurement systems (PMS) play a critical role in the functioning of any organization. However, big data has been influencing those systems distinctly. Thus, the aim of this article is to know the influence of big data analytics on the characteristics of PMSs. Research method - Systematic review of the literature of academic papers with studies of the use of BDA technologies in PMS. Findings - BDA allows new performance measures implementation as well as the improvement of existing ones. The changes in the elements of PMSs bring benefits, such as real-time performance measurement, the possibility of performing predictive analysis, simulations and better dissemination of information, in addition to the maturation of PMSs. However, it is necessary to overcome some challenges for its implementation and use, such as the involvement of senior management and other levels of the organization and the creation of intangible

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Synonyms:

Purpose - Performance measurement systems (PMS) play a critical role in the functioning of any organization. However, big data has been influencing those systems distinctly. Thus, the aim of this article is to know the influence of big data analytics on the characteristics of PMSs.

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However, it is necessary to overcome some challenges for its implementation and use, such as the involvement of senior management and other levels of the organization and the creation of intangible

Goals - Performance measurement systems (PMS) are essential to any organization's operation. But big data has been significantly affecting those systems. The purpose of this article is to understand how big data analytics has affected the characteristics of PMSs.

Research approach: Systematic examination of academic literature that includes studies on the application of BDA technology in PMS.

Findings - BDA enables the installation of new performance measures as well as the enhancement of existing ones. In addition to the development of PMSs, the changes in the components of PMSs offer advantages such real-time performance assessment, the ability to undertake predictive analysis, simulations, and better information dissemination. However, in order to use and apply it various obstacles must be overcome.

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1/7 Sentences • 117 Words

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198/125 Words

- Paraphraser
- Grammar Checker
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- Chrome Extension
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Modes: Standard Fluency Formal Simple Creative Expand Shorten

Synonyms: 

Purpose - Performance measurement systems (PMS) play a critical role in the functioning of any organization. However, big data has been influencing those systems distinctly. Thus, the aim of this article is to know the influence of big data analytics on the characteristics of PMSs.

Research method - Systematic review of the literature of academic papers with studies of the use of BDA technologies in PMS.

Findings - BDA allows new performance measures implementation as well as the improvement of existing ones. The changes in the elements of PMSs bring benefits, such as real-time performance measurement, the possibility of performing predictive analysis, simulations and better dissemination of information, in addition to the maturation of PMSs.

However, it is necessary to overcome some challenges for its implementation and use, such as the involvement of senior management and other levels of the organization and the creation of intangible capabilities for creating insights.

Limitations of the research - impossibility of generalizing the results.

Practical implications - assist in future academic work and organizational

Goals - Performance measurement systems (PMS) are essential in any organization's operation. But big data has been significantly affecting those systems. The purpose of this article is to understand how big data has profoundly impacted the characteristics of PMSs.

Research approach: Systematic examination of academic papers includes studies on the application of BDA technologies in PMS.

Findings - BDA enables the installation of new performance measures as the enhancement of existing ones. In addition to the development of PMSs, the changes in the components of PMSs offer advantages such real-time performance assessment, the ability to undertake predictive analysis, simulations, and better information dissemination. However, in order to use and apply it, various obstacles must be overcome.

- profoundly impacting
- seriously impacting
- significantly impacting
- greatly impacting
- substantially impacting
- majorly impacting
- Break

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Purpose - Performance measurement systems (PMS) play a critical role in the functioning of any organization. However, big data has been influencing those systems distinctly. Thus, the aim of this article is to know the influence of big data analytics on the characteristics of PMSs.

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Limitations of the research - impossibility of generalizing the results.


organizational projects of BDA implementation in PMS.

All 19 Grammar 15 Sentence suggestions 4



 **2 sentence suggestion(s)** available only for Premium users.

- Replace with Ignore

- Remove extra space.

- Replace with
method
- Replace with
a
- Remove the capitalization
systematic


 15 **Fix Errors**
 Paraphrase
 198 Words
 < >
 < >
 < >
 < >

Paragraph AI A B I U A A

Modes: Standard Synonyms:

This paper aims to present the results of using QuillBot to improve a paper's readability.

This **essay** aims to **demonstrate how** using QuillBot **can increase** a paper's readability.

1 Paraphrase Summarize Suggest Text 15 Words 0

3 < Insert Rephrase



QuillBot is an AI-powered writing assistant that uses machine learning algorithms to paraphrase and simplify text. The study conducted in this paper evaluates the effectiveness of QuillBot in enhancing the clarity and coherence of written communication.

QuillBot is a powerful tool that uses AI to paraphrase and reword text, making it more concise and easier to understand. The study conducted in this paper provides insights into the effectiveness of QuillBot in enhancing the readability of academic writing.

QuillBot is a powerful AI-based tool that can rephrase sentences and paragraphs to make them more concise and easier to understand. The study found that using QuillBot resulted in a significant improvement in the readability of the paper.



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Summarizer ⓘ

Key Sentences **Paragraph**

Summary Length: Short Long

Purpose – Performance measurement systems (PMS) play a critical role in the functioning of any organization. However, big data has been influencing those systems distinctly. Thus, the aim of this article is to know the influence of big data analytics on the characteristics of PMSSs.

Research method – Systematic review of the literature of academic papers with studies of the use of BDA technologies in PMS.

Findings – BDA allows new performance measures implementation as well as the improvement of existing ones. The changes in the elements of PMSSs bring benefits, such as real-time performance measurement, the possibility of performing predictive analysis, simulations and better dissemination of information, in addition to the maturation of PMSSs. However, it is necessary to overcome some challenges for its implementation and use, such as the involvement of senior management and other levels of the organization and the creation of intangible capabilities for creating insights.



This article examines the influence of big data analytics on performance measurement systems (PMSSs). It finds that BDA can bring benefits such as real-time performance measurement, predictive analysis, simulations, and better dissemination of information. However, it is necessary to overcome challenges such as senior management involvement and intangible capabilities for creating insights.

Select keywords ⓘ

- critical role
- BDA technologies
- BDA implementation
- big data

198 Words

Summarize

3 Sentences • 52 Words

Paraphrase Summary



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Purpose – Performance measurement systems (PMS) play a critical role in the functioning of any organization. However, big data has been influencing those systems distinctly. Thus, the aim of this article is to know the influence of big data analytics on the characteristics of PMSs. **Research method** – Systematic review of the literature of academic papers with studies of the use of BDA technologies in PMS. **Findings** – BDA allows new performance measures implementation as well as the improvement of existing ones. The changes in the elements of PMSs bring benefits, such as real-time performance measurement, the possibility of performing predictive analysis, simulations and better dissemination of information, in addition to the maturation of PMSs. However, it is necessary to overcome some challenges for its implementation and use, such as the involvement of senior management and other levels of the organization and the creation of intangible

Instructions

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This tool produces the following:

The original content rephrased so that the original structure and content are still there but it's now better in the way the instructions ask

Smarter

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Results

três opções

Objective – The critical role of Performance Measurement Systems (PMS) in organizational functioning is well-established, but the notable impact of big data on these systems requires further exploration. Consequently, this article investigates the effects of big data analytics on PMS characteristics.

Research Approach – A systematic review of academic literature, focusing on studies that discuss the integration of Big Data Analytics (BDA) technologies into PMS, was conducted.

Outcomes – BDA enables the introduction of new performance indicators and enhances current ones. Alterations made to PMS elements yield advantages, such as real-time performance assessment, predictive analysis capabilities, simulation execution, improved information dissemination, and PMS maturation. Nevertheless, implementing and utilizing BDA presents challenges that need to be addressed, including securing the commitment of senior management and other organizational levels, and fostering intangible capacities to generate insights.

Research Constraints – The results obtained in this study cannot be generalized.

Practical Application – The findings offer valuable insights for future academic endeavors and organizational projects involving BDA implementation in PMS.

Originality/Significance – This article's distinctiveness lies in its comprehensive examination of an emerging PMS landscape brought about by the vast amount of data currently available.

Objective – The critical role of performance measurement systems (PMS) in organizational functioning is well-established. However, big data has been uniquely impacting these systems. This article seeks to explore the influence of big data analytics on the attributes of PMSs.

Research Approach – A systematic literature review of academic papers that study the use of big data analytics technologies in PMS was conducted.

Outcomes – Big data analytics enable the introduction of new performance measures and enhance existing ones. Alterations in PMS components yield advantages, such as real-time performance evaluation, predictive analysis capabilities, simulation opportunities, and superior information dissemination, leading to PMS maturation. Nevertheless, certain



This tool requires the Chrome extension

Get Extension

Results



Flexible Link Assistant

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HyperWrite

Added

Source Link

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Jason Kuperberg

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1. Begin with a clear and concise introduction that outlines the context, purpose, and significance of the study.
2. Define key concepts, such as HypeWrite and readability, to ensure that readers understand the focus of your research.
3. Explain your methodology for selecting the 25 papers as well as how you utilized HypeWrite to improve their readability.
4. Present the results in a clear and structured manner, using tables, charts, or figures to visually represent any significant data or patterns.
5. Compare and analyze the readability scores before and after using HypeWrite, discussing any trends or noteworthy findings.
6. Address any limitations of your study and suggest areas for future research or improvement in using AI-powered writing assistants.
7. Conclude by summarizing the implications of your findings and highlighting their relevance to both academic research and practical applications.

By following these guidelines, your paper will effectively communicate the outcome of your study while maintaining clarity and focus on your primary objective of assessing HypeWrite's impact on readability improvement.

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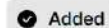
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Request

Summarize the content

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Results

The study aimed to investigate the definitions, requirements, and applications of Digital Twin (DT) models using a systematic literature review from Science Direct, Scopus, and Web of Science. The method involved bibliometric analysis of 332 articles and content analysis of 17 filtered articles relevant to the framework proposal. The results showed that authors have different definitions and processes for creating a DT, which represents real-world elements for performance monitoring, scenario simulation, and decision-making. Researchers often used software without trial licenses or student versions. Based on these findings, the study



Usando Chrome Extension

The image shows the HyperWrite Chrome extension interface. At the top left, there is a logo for HyperWrite and a text input field labeled "Enter a descriptive title". To the right of this are navigation buttons for "Tools", "Support/Feedback", "Join our Discord", and a blue "Saved" button. Below the title field is a rich text editor toolbar with icons for bold (B), italic (I), underline (U), list (☰), link (🔗), and unlink (🔗), along with a dropdown menu currently set to "Normal".

The main content area contains a paragraph of text:

Performance measurement systems (PMS) play a critical role in performance management. Big data analytics (BDA) can positively influence PMS elements. This article aims to analyze the empirical results on the effects of using big data analytics in performance measurement systems. We applied a systematic literature review on a sample of eleven articles indexed in the SCOPUS scientific index after analyzing a large sample after applying a search string. The results show that the BDA supports the addition of new performance measures and improves some of the existing ones. Changes in PMS elements bring benefits such as real-time performance measurement, application of predictive analytics, simulations and better information dissemination. However, it is imperative to overcome some challenges, such as the involvement of senior management and other levels of the organization, and the creation of intangible capabilities to produce insights. The present article contributes to the literature by providing new empirical evidence on the effects of using BDA in PMS. It identifies key success factors for implementation and provides practical recommendations for improving PMS.

On the right side, there is a sidebar for the AI writing assistant. It features a "TypeAhead Mode" selector with options "Always", "Sometimes", and "Never", and a "Word Count: 172" indicator. The sidebar has two tabs: "AutoWrite" (selected) and "Template". Under the "AutoWrite" tab, there is a prompt: "What do you want to write about?". Below the prompt is a text box containing the text: "Abstract scientific paper on how big data analytics affects the performance measurement systems". To the right of the text box, it shows "95/300" characters and a "Best Practices" link. At the bottom right of the sidebar is a blue "AutoWrite" button with a lightning bolt icon. On the left side of the sidebar, there are icons for a chatbot, a "New!" notification, a speech bubble, and a gear for settings.



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**New
project**



Title: *Complexity*
Theory and Supply
Chain Manag...





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← Project title: Complexity Theory and Supply Chain Management

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Tone

Choose the tone of the article

Dropdown menu for Tone

Keywords

Choose the keywords for the article

Text input field for Keywords

Press enter to add a keyword

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Original article
Systematic review
Review

Scientific
Informative
Opinionated
Academic

Title

Complexity Theory and Supply Chain Management

Authors and Affiliation

Insert your text here

Abstract

This paper aims to

Introduction

In today's dynamic and volatile business environment, organizations are increasingly turning to Complexity Theory as a way to understand and manage their supply chain operations. By leveraging the power of complexity science, companies can gain an improved understanding of their supply chains, enabling them to make more informed



● ★ Magic Mode is Off

Selected text:

This paper aims to



18/200

Suggestion #1: study the effects of This paper aims to study the effects of null on null.



Suggestion #2: This paper aims to explore the concept of null and its implications on our understanding of modern society. By examining various points of view, this article seeks to identify how null can be used as a tool for creating positive change in our lives and in the world around us. It is hoped that through an exploration

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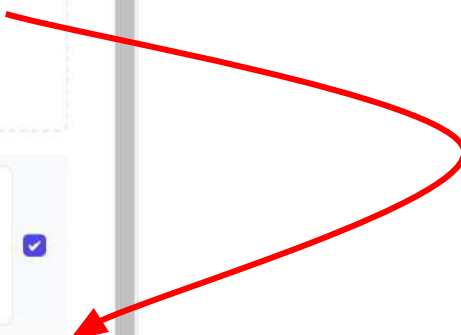
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Palavras-chave 🔑 52 / 500

EPMS, Enviromental Performance, Performance Measures

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Introdução

As empresas estão cada vez mais enfrentando desafios competitivos, e a preocupação com o desempenho ambiental tem se tornado uma prioridade. Pressionadas por stakeholders e reguladores, as empresas estão buscando melhorias ambientais e provas de que estão fazendo progressos nessa área. Nesse contexto, a necessidade de uma estrutura integrada para os indicadores de desempenho ambiental se torna fundamental.

Neste artigo, vamos explorar uma estrutura integrada para os indicadores de desempenho ambiental, dividida em quatro categorias principais: o estado do ambiente, a política ambiental corporativa, os sistemas de gestão ambiental e os produtos e processos da empresa.

O Estado do Ambiente

A avaliação do estado do ambiente é essencial para determinar a contribuição relativa de uma empresa para o impacto ambiental, tanto nacional quanto europeu. Essa avaliação permite comparar o impacto da empresa com o documento de referência "Europe's Environment: Statistical Compendium for the Dobris Assessment". Ao avaliar o estado do ambiente, a empresa pode identificar áreas em que precisa melhorar seu desempenho ambiental.

A Política Ambiental Corporativa

A política ambiental corporativa é a base da estrutura integrada de indicadores de desempenho ambiental. Essa política deve ser abrangente e abordar 21 metas-chave para garantir que todas as iniciativas ambientais significativas da empresa recebam o reconhecimento adequado. A política ambiental corporativa deve ser clara, bem definida e



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Além disso, a participação dos stakeholders na definição de estratégias de sustentabilidade é fundamental para garantir sua relevância e credibilidade.

Conclusão

A definição de indicadores de desempenho ambiental é fundamental para que as empresas possam avaliar e melhorar seu impacto ambiental. A estrutura integrada apresentada neste artigo permite que as empresas avaliem seu desempenho em relação ao estado do ambiente, à política ambiental corporativa, aos sistemas de gestão ambiental e aos produtos e processos. A utilização desses indicadores traz benefícios tanto para as empresas quanto para a sociedade como um todo, promovendo a sustentabilidade e a responsabilidade ambiental.

Este artigo foi baseado em referências acadêmicas:

- Azzone, G., Noci, G., Manzini, R., Welford, R., & Young, C. W. (1996). Defining environmental performance indicators: An integrated framework. *Business Strategy and the Environment*, 5(2), 69-80.
- Bloom, M., & Scott Morton, M. (1991). The impact of environmental regulation on industry location decisions: The motor vehicle industry. *Journal of Environmental Economics and Management*, 21(2), 129-145.
- Welford, R. (1995). *Corporate environmental management: Towards sustainable development*. Routledge.

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Definindo Indicadores de Desempenho Ambiental Estrutura Integrada



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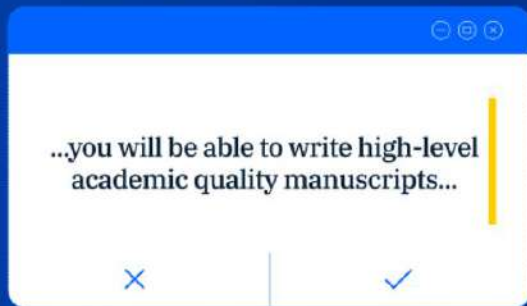
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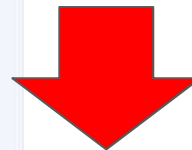
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Capturing customer value perception is crucial for driving supply chain performance improvements. In fact, the core of supplier management resides in its impact on value generation and on end-customer satisfaction. Social media analytics of customer sentiment enables large-scale group decision-making (LSGDM) to support supplier value generation. However, studies in the literature do not elaborate on the linkage between the supply management process and customer value drivers, neither how the customer value perception relates to the value delivered by suppliers. State-of-the-art natural language processing approaches, such as aspect-based sentiment analysis (ABSA), have the potential to address this issue. Nevertheless, such a proposition is not found in the literature. Furthermore, the inherent subjectivity of the mined sentiments and uncertainty of managerial judgments should be accounted for. To overcome this, computing with words with the fuzzy set theory has been applied to support supply chain decisional processes. Therefore, the present study proposes an LSGDM model that combines ABSA with fuzzy inference systems (FIS) to support supplier evaluation driven by customer value perception. The central idea of the proposed model is to track customer perceived value quantitatively over time with ABSA, from social media, and use it as an input to a multiple-FIS based supplier evaluation approach. An application considering the case of a large manufacturer of smartphones illustrates the model's application. The main results show the model capability of capturing customer perceptions and internalizing them as a driver for continuous improvement initiatives in supplier development.

Language



11 sentences ready for review

Article Usage

Furthermore, the inherent subjectivity o...

Rephrase, Word Choice, Article Usa...

To overcome this, computing with words with the fuzzy set theory has been applied to support supply chain decision-making decisional processes.

Click on a suggestion to accept or reject it.

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Rephrase

Therefore, the present study proposes a...

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The central idea of the proposed model ...

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- ✗ Missing ethics statement
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Figures and tables

- ✓ All figures and tables have citations
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- ✗ Abstract is too long
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- ✓ Title length is good
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- ✓ No known copyrighted methods mentioned

Structure

- ✗ Manuscript does not follow the IMRaD model
- ✗ Abstract is not a structured abstract

References

- ✗ Too many too old references
- ✓ There are no citations in the abstract
- ✓ Reference count is good
- ✗ References with no citations
- ✓ No use of self citing detected

Language

- ✓ No inappropriate language found
- ✗ Missing plain language summary
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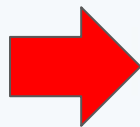
Abstract

Estimation of learning curves is ubiquitously based on the proportion of correct responses within moving trial windows. **Therefore** **Thereby**, it is assumed that the learning performance **remains stays** constant within the moving windows, which may **often** not be the case. In the present study, we demonstrate that this assumption's violations lead to systematic errors in the analysis of learning curves, **and**. We explore the dependency of these errors on window size, different statistical models, and the learning phase. **To reduce** **For-reducing** these errors in the analysis of single subject data, we propose adequate statistical methods for the estimation of learning curves and construction of confidence intervals in a **trial-by-trial** **trial-by-trial** manner. Applied to data from an avoidance learning experiment with rodents, these methods revealed performance changes **occurring** **happening** at

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RM

Here is a 1,993 word academic review article comparing and contrasting the two research papers on measuring corporate environmental performance:

A Review and Comparative Analysis of Approaches to Measuring Corporate Environmental Performance

Introduction

Corporate environmental performance has become an issue of vital importance to a wide range of stakeholders, including investors, consumers, employees, and the general public. However, measuring and evaluating this multifaceted construct remains a complex challenge, with companies utilizing a diverse array of indicators that often lack consistency and comparability (Ilinitch et al., 1998; Metcalf et al., 1996). This review paper compares and contrasts two influential research articles that have aimed to conceptualize and empirically analyze frameworks for assessing corporate environmental performance.

Ilinitch et al. (1998) present a theoretical model with four key dimensions of environmental performance and test this model using factor analysis on publicly available datasets. In contrast, Metcalf et al. (1996) take a more applied approach by summarizing "best practices" in environmental performance measurement based on a corporate benchmarking study. Both articles provide valuable insights into the development of standardized metrics, but also reveal the difficulties in defining and

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Ilinitch et al. (1998) present a theoretical model with four key dimensions of environmental performance and test this model using factor analysis on publicly available datasets. In contrast, Metcalf et al. (1996) take a more applied approach by summarizing "best practices" in environmental performance measurement based on a corporate benchmarking study. Both articles provide valuable insights into the development of standardized metrics, but also reveal the difficulties in defining and quantifying this construct. This review summarizes the key contributions of each article, critically evaluates their research approaches, and synthesizes opportunities for future research.

Summary of Ilinitch et al. (1998)

Ilinitch et al. (1998) note the lack of consensus on how to define and measure corporate environmental performance. They review conceptual literature to identify four key dimensions: organizational systems, stakeholder relations, external impacts, and regulatory compliance. The authors test this model by performing a principal components analysis on environmental indicators for 293 S&P 500 companies using Investor Responsibility Research Center (IRRC) data. The results generally validate their proposed four-factor structure, with stakeholder relations splitting into two components of disclosure and political contributions.

Ilinitch et al. (1998) go on to evaluate the reliability and validity of indicators by comparing rankings of petroleum firms across different data sources. They find considerable variability, highlighting issues with using available metrics like the Toxic Release Inventory as a proxy for overall environmental performance. The authors also regress ratings from two agencies on their factor scores, finding the ratings weight dimensions differently and are significantly influenced by recent environmental events.

The authors conclude by arguing standardized metrics are needed and that accountants are well-positioned to develop these given their expertise in measurement and reporting. They contend measures should be evaluated based on characteristics such as cost-benefit ratio, interpretability, fairness, and ability to track improvements over time.

Critical Evaluation of Ilinitch et al. (1998)

A major strength of Ilinitch et al.'s (1998) study is the use of empirical factor analysis to test theorized dimensions of environmental performance. The four-construct model provides a conceptual foundation for organizing the diversity of indicators. Their results lend support to the validity of this framework, although further testing with additional measures could provide stronger validation.

The comparison of petroleum firm rankings illuminates reliability and consistency issues with measures from different sources. However, the analysis is limited in scope, focusing only on one industry. Expanding the cross-data reliability analysis to more companies and sectors would provide greater insight.

While the regression of ratings onto factor scores sheds light on how aggregated metrics capture the underlying dimensions, the low variance explained indicates other relevant variables are omitted. As the authors note, this likely includes intangible factors like reputation. Incorporating a broader set of measures could potentially increase explanatory power.

Overall, Ilinitch et al. (1998) make a persuasive argument for the need for valid, reliable environmental performance measurement systems. Connecting their conceptual model to empirical analysis provides a helpful foundation for developing such standards. Their conclusions on the critical role and qualifications of accountants in designing these systems are well-reasoned given accountants' expertise.

Summary of Metcalf et al. (1996)

In contrast to the academic approach of Ilinitch et al. (1998), Metcalf et al. (1996) take a more applied perspective grounded in a corporate benchmarking study. The article outlines "best practices" in utilizing environmental performance indicators based on observations from the benchmarking analysis.

Metcalf et al. (1996) discuss how indicators can enhance environmental management by clarifying goals, focusing attention, promoting accountability, and enabling communication. They provide corporate examples like Olin Corporation's use of indicators to integrate environmental objectives into planning and compensation. The article summarizes characteristics of effective indicator systems gathered from the benchmarking study participants.

While not empirically testing measurement models, Metcalf et al. (1996) assess the surveyed companies as having relatively robust process indicators compared to outcome-based metrics. They note limitations like compliance audits not indicating proactive initiatives. The authors conclude proper implementation of indicators can yield management benefits for both corporations and the environment.

Critical Evaluation of Metcalf et al. (1996)

The main contribution of Metcalf et al.'s (1996) article is providing practitioner-relevant insights into implementing and leveraging environmental performance measurement based on real company examples. This complements the more theoretical approach of Ilinitch et al. (1998). The focus on managerial best practices makes the recommendations accessible for business leaders seeking to improve their systems.

However, the reliance on a single benchmarking study means findings may not generalize. The limited set of companies and self-reported data restrict robust quantitative analysis. While indicative of general trends, the observations warrant further empirical examination. Surveying a larger, randomized sample could provide more definitive conclusions.

Additionally, the distinctions made between process and outcome indicators, while intuitively appealing, lack statistical validation. The four-dimensional structure proposed by Ilinitch et al. (1998) could be used as the basis for a more rigorous evaluation of measurement types, rather than broad categories of process and outcome.

Despite these limitations, Metcalf et al. (1996) offer useful practical guidelines for implementing environmental performance measurement grounded in real organizational context. This complements Ilinitch et al.'s (1998) empirically-validated but theoretical model.

Synthesis and Conclusions

Together, these two articles provide valuable yet distinct perspectives on measuring corporate environmental performance. Ilinitch et al. (1998) developed a parsimonious four-factor theoretical structure and conducted initial empirical tests of its validity. Meanwhile, Metcalf et al. (1996) summarized applied best practices in using indicators based on a sample of companies.

There are clear opportunities for beneficial integration between these approaches. Ilinitch et al.'s (1998) model could provide theoretical grounding for surveys of a broader sample like Metcalf et al. (1996). The four constructs could be evaluated regarding their alignment with managerial needs identified by Metcalf et al. (1996). Also, Metcalf et al.'s (1996) process versus outcome distinction merits deeper empirical examination through methods like Ilinitch et al.'s (1998) factor analysis.

Ultimately, the consistency and comparability issues raised by both articles highlight the need for accountants and researchers to collaborate in developing standardized corporate environmental performance measurement systems. This review synthesizes complementary academic and applied perspectives that provide a useful launching point for such initiatives. Integrating rigorous empirical modeling with practitioner insights can yield reporting standards that balance conceptual foundations and practical

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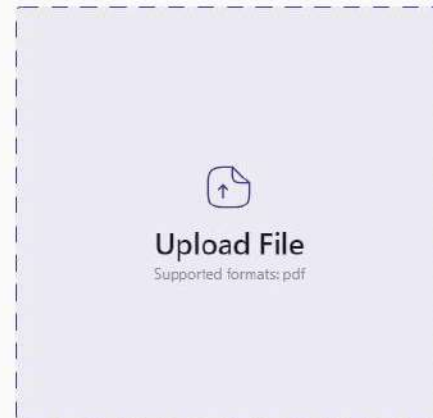




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Introduction

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User reviews of products and services inherently store competitive value and can be used to monitor customer value perception. There has been a notable surge in the interest surrounding sentiment analysis (SA) and Aspect-Based Sentiment Analysis (ABSA) to detect and categorize opinions, sentiments, and attitudes. LSGDM is proposed combining ABSA with Fuzzy Inference Systems (FIS) to support supplier evaluation driven by customer value perception, allowing for scenario simulation and development of action plans. The process of evaluating suppliers for their segmentation involves multiple criteria, which introduces challenges related to decision makers' subjectivity and the uncertainties associated with assessing qualitative criteria or the lack of sufficient data for quantitative analysis. ABSA can be used to extract information to feedback customer value perception to supply chain management. Furthermore, ABSA can be used to assess customer value perception and improve supplier management decisions.

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 - inédito
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 - com ganhos de produtividade e qualidade
- Importância dos **prompts**
- **Curadoria** sempre!
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