



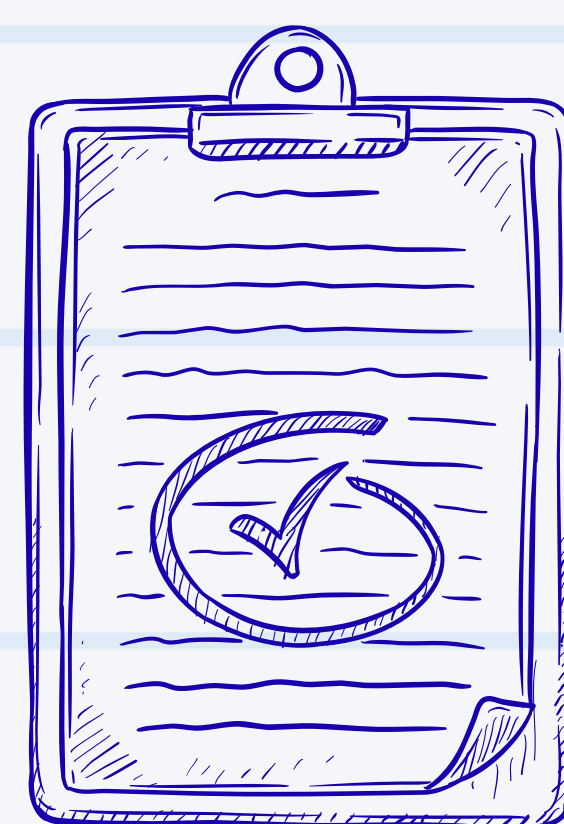
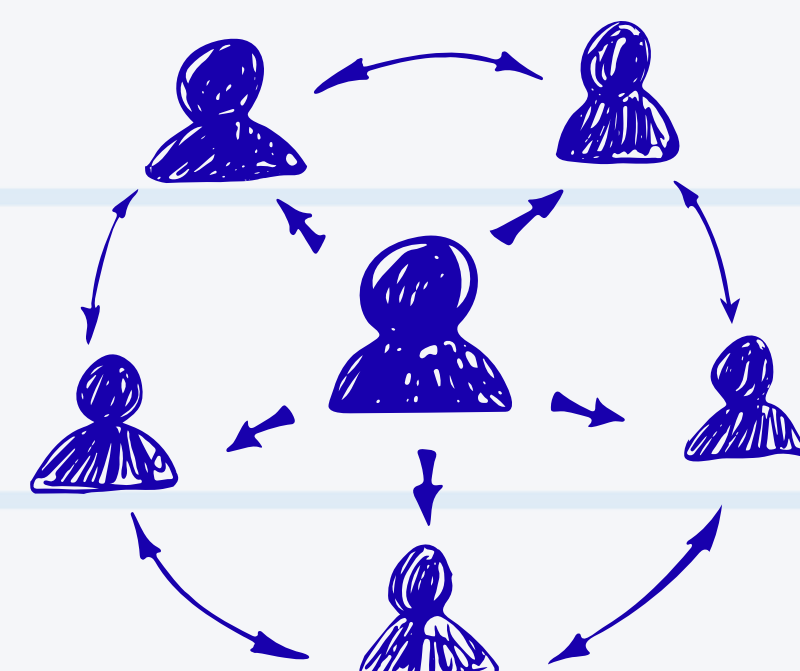
Innovation in Agrifood Systems: A SWOT (Strengths, Weakness, Opportunities, and Threats) analysis of ChatGPT for Scientific Information

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Purpose: This SWOT analysis highlights the significance of ChatGPT in transforming agrifood systems through automation, scalability, and data-driven insights.

Strengths

- Improves efficiency through the automation of repetitive tasks such as data processing, documentation, customer support, etc.
- Streamlines workflows and reduces manual labor which increases productivity (Ray, 2023).
- Beneficial in contexts where human resources are limited or overextended.
- Scalability and accessibility due to multi-languages, virtual access, and outreach to geographically isolated, or otherwise inaccessible farming communities (Singh et al., 2024).



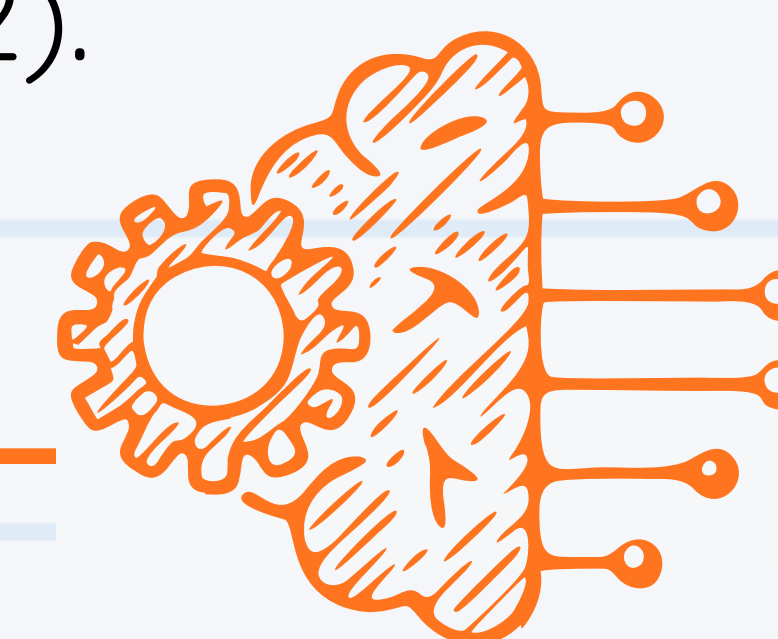
Opportunities

- Enhancements could increase accessibility, accuracy, and safety.
- A gap remains in training users to use ChatGPT efficiently and effectively, especially in agrifood systems where such technology is still new.
- Training should include strategies to reduce AI hallucinations: using relevant documents, restricting data sources, and applying negative prompting (Marinkovic & Baum, 2025).
- Newer ChatGPT models can provide links to external resources, allowing users to verify the accuracy of generated content.



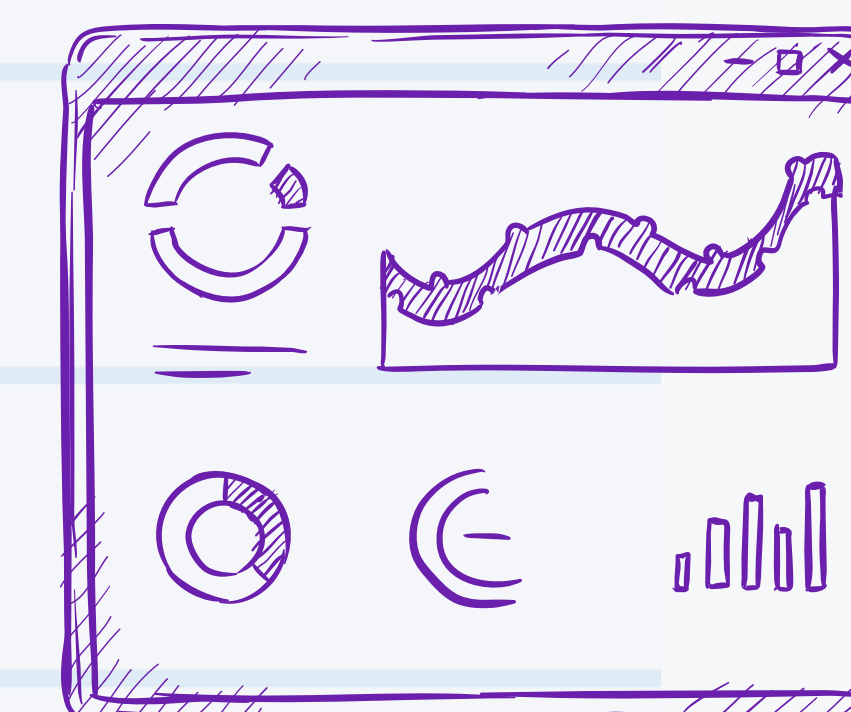
Weakness

- AI hallucination, ethical implications, and impacts on users.
 - AI hallucination: AI producing inaccurate and misleading responses (Antonin & Ondrej, 2024; Marinkovic & Baum, 2025); may result from discipline-specific language the model does not understand or from combining information across multiple sources, sometimes generating fabricated references.
- Without proper verification, hallucinated outputs can lead to harmful decisions: incorrect livestock vaccination dosages or improper application of fertilizers or herbicides (Tzachor et al., 2022).



Threats

- Regulatory and ethical concerns related to data ownership, privacy, and governance (Ray, 2023): large volumes of operational and environmental data are collected and analyzed without clear guidelines on consent or data usage rights for agrifood systems context.
- Misinformation and over-reliance on AI-generated outputs: inaccurate responses could lead to harmful agricultural decisions and sociocultural resistance rooted in risk aversion and limited trust in automated systems.
- Cybersecurity: vulnerabilities in AI-integrated farming systems could disrupt operations or compromise data.



Conclusions: We underscore the need for improved infrastructure, regulation, and education for the use of ChatGPT in agrifood systems (Marinkovic & Baum, 2025).

