University of St.Gallen
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The Use and Impact of AI-Tools in Early-Stage Startups



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From insight to impact.

Introduction: All talk and what action???

- Everybody is talking about AI but we know little about how it is used in practice.
- The launch of ChatGPT-3 in Nov. 2022 can be considered a "transformative shift" in how AI integrates with daily human activities.
- Conceptual research points towards promising uses of AI in entrepreneurship (Giuggioli & Pellegrini, 2023).
- Through AI, entrepreneurial agency may become more distributed (Nambisan, 2017) and AI might even be considered as additional co-founder (Brown, 2024).
- Research questions:
  1. *Which and how are AI systems currently used in early-stage ventures?*
  2. *How does the implementation of AI change the overall process of venture creation?*
  3. *What is the measurable impact of AI on the efficiency of the entrepreneurial process?*
- Approach: Mixed-method study, incl. qualitative interviews and quantitative analysis

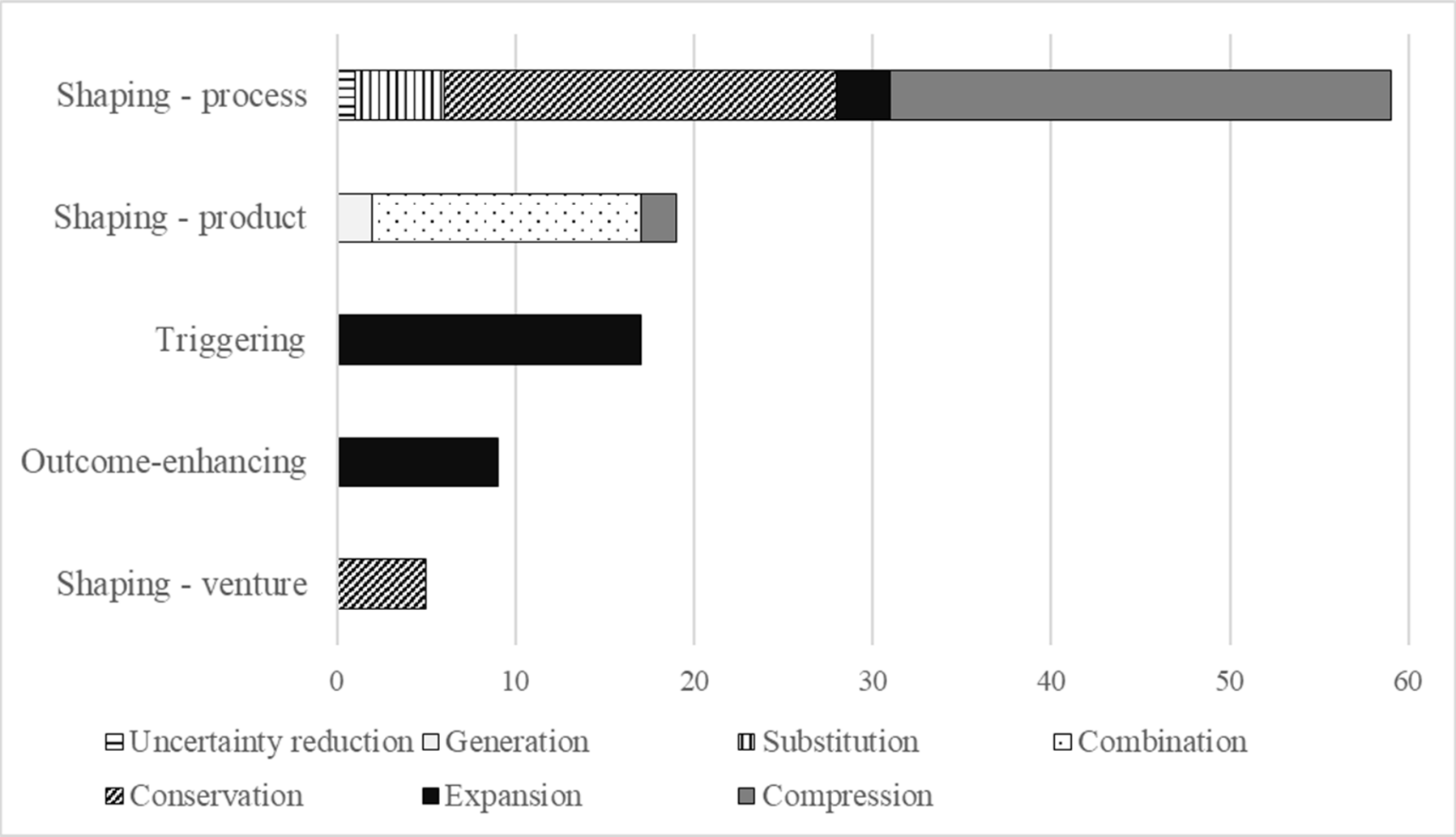
Conceptual Framework

- External Enabler Framework (EEF): Focuses on external factors influencing entrepreneurial opportunities (Davidsson et al. 2020)
- Key Dimensions:
  - Characteristics (scope, onset)
  - Mechanisms (compression, conservation, etc.)
  - Roles (triggering, shaping, enhancing, etc.)

Study 1: Qualitative Study - Methodology

- ***Approach***: Semi-structured interviews with 14 founders of early-stage IT startups from Austria, Germany, Spain, Switzerland, and the U.S.
- ***Interview Focus***: Exploration of the use of AI tools, such as type of tools used, tasks supported, the roles AI played, and the perceived outcomes.
- Interviews were transcribed, coded, and categorized (mainly deductively) using the External Enabler Framework (EEF) by Davidsson et al (2020)
- 109 cases of AI use identified, grouped into 29 unique use cases (UCs)
- 9 task categories: idea generation, business model validation, product building, sales, marketing, etc.

Study 1: Qualitative Study - Findings



Study 1: Qualitative Study - Findings

- **ChatGPT** emerged as the most frequently used AI tool (Reason: broad applicability. More specialized tools might become relevant later)
- **Role of AI: Dominance of process-shaping role.**
  Founders leveraged AI for efficiency, primarily to streamline tasks, get additional insights, facilitate decision-making, and conserve resources rather than to replace human roles.
- **Mechanisms Observed**:
  - **Compression** (time-saving) most common, with AI tools enabling faster task completion and decision-making.
  - **Conservation** (resource-saving) was also notable, as AI reduced the need for human resources in tasks like research and data analysis.
- => we test these two mechanisms in the subsequent quantitative study.

«So at the end of the day, it's an efficiency-boosting tool. (...) And I think you can definitely get further and are faster with the same amount of staff using the AI tools that we now have.»

Quelle: IP#6

Study 2: Quantitative Study - Methodology

- ***Objective***: To quantitatively measure AI's impact on startup efficiency
- ***Data***: Startup data from Crunchbase and LinkedIn, focusing on U.S.-based startups in the IT and finance sectors.
- ***Measurement of key variables:***
  - Compression: Time from foundation to seed funding.
  - Conservation: Employee count one month before seed funding.
- Comparison of startups founded immediately before / after ChatGPT-3:

Group	Creation Min	Creation Max	Period Gap (days)	Seed Funding Min	Seed Funding Max	Period Gap (days)
2023	December 1, 2022	November 30, 2023	364	June 1, 2023	November 30, 2023	182
2022	December 1, 2021	November 30, 2022	364	June 1, 2022	November 30, 2022	182

Study 2: Quantitative Study - Findings

- ***Time to Funding***: Startups founded after ChatGPT-3 achieved seed funding significantly *faster* than those before, with an average reduction of 50 days.
- ***Employee Count***: Post-ChatGPT startups had fewer employees at the time of seed funding (post: 3.5 employees vs. pre: 8 employees). AI tools allow startups to achieve key milestones with smaller teams.
- *Method observation*: Comparing the "efficiency" of startups in the entrepreneurial process is challenging…

General Discussion

- ***AI is an efficiency tool … :*** AI facilitates diverse aspects of the entrepreneurial process and enables startups to achieve milestones quicker and with leaner teams.
- Efficiency-related mechanisms are much more widespread than direct effects on product offerings.
- Our results suggest that different applications of a new technology (in this case AI) have different degrees of ***agency-intensity***, referring to the level of effort that is required in actualizing an opportunity (Ramoglou & Tsang, 2016).
- AI tools have a low agency-intensity concerning the improvement of internal processes and a higher agency-intensity concerning the development of new product offerings, as already presumed by (Davidsson & Sufyan, 2023). AI-based new product offerings are likely to emerge *later* in the process of AI adoption.
- While impactful, human agency remains central to entrepreneurship, i.e., AI cannot be considered as an additional co-founder (Brown 2024).

Conclusion and Outlook

- ***For Entrepreneurs***: AI is a valuable tool for entrepreneurial efficiency; it has the potential to help start-ups become operational with fewer employees and thus counter the shortage of skilled workers.
- ***For Academics***: Contributes to the discussion around entrepreneurial agency and illustrates the applicability of the external enabler framework in this context.
- ***Limitations***: It is challenging to distinguish between AI-infused compression and conservation effects and investor-related supply-side effects, resulting from the hype surrounding AI.
- ***Future Exploration***: Broader research on AI's long-term impact on venture creation and growth.

Thank you for your questions and comments!

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