Towards Human-Chatbot Interaction: A Virtual Assistant for the Ramp-up Process

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Hypothesis

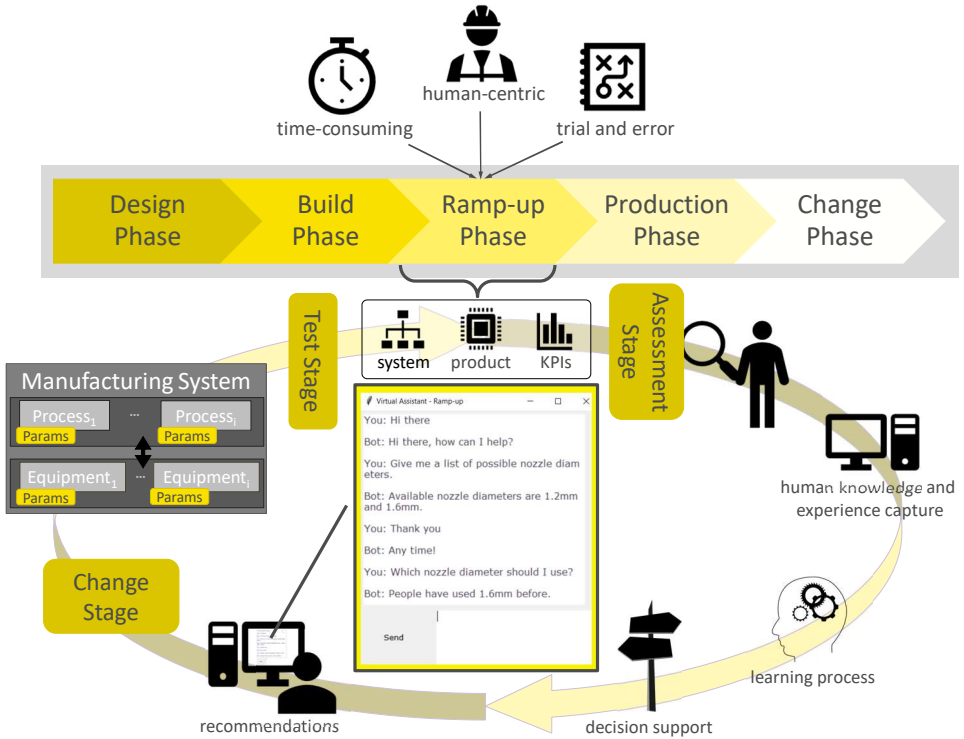
"Providing shop-floor operators with a virtual assistant during the ramp-up process will reduce the number of trials required to bring a system to its operational state (ramp-up)."

Ramp-up

- Human to perform process and equipment adjustments based on knowledge and expertise [1], [2].
- Verify if Key Performance Indicators (KPIs), such as functionality, product quality, cycle time, etc., are fulfilled [3].

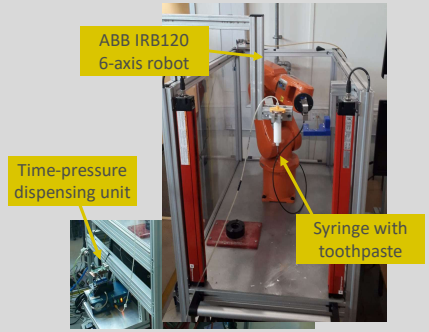
Research Work Overview

- Develop decision-support framework to better integrate human into the ramp-up.
- Natural Language Processing tools used to develop chatbot for ramp-up [4] to provide recommended change actions.



Future Work

- Enhance chatbot.
- Evaluate the usefulness and effectiveness of chatbot by comparing usage and duration.
- Ramp-up of robotised dispensing workstation.
- Participants to tune system parameters to obtain good product quality and cycle time.



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References

[1] C. Terwiesch and R. E. Bohn, "Learning and process improvement during production ramp-up," Int. J. Prod. Econ., vol. 70, pp. 1–19, 2001.
[2] S. Doltsinis, P. Ferreira, and N. Lohse, "Reinforcement learning for production ramp-up: A Q-batch learning approach," Proc. - 2012 11th Int. Conf. Mach. Learn. Appl. ICMLA 2012.
[3] S. Doltsinis, S. Ratchev, and N. Lohse, "A framework for performance measurement during production ramp-up of assembly stations," Eur. J. Oper. Res., vol. 229, no. 1, pp. 85–94, 2013.
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