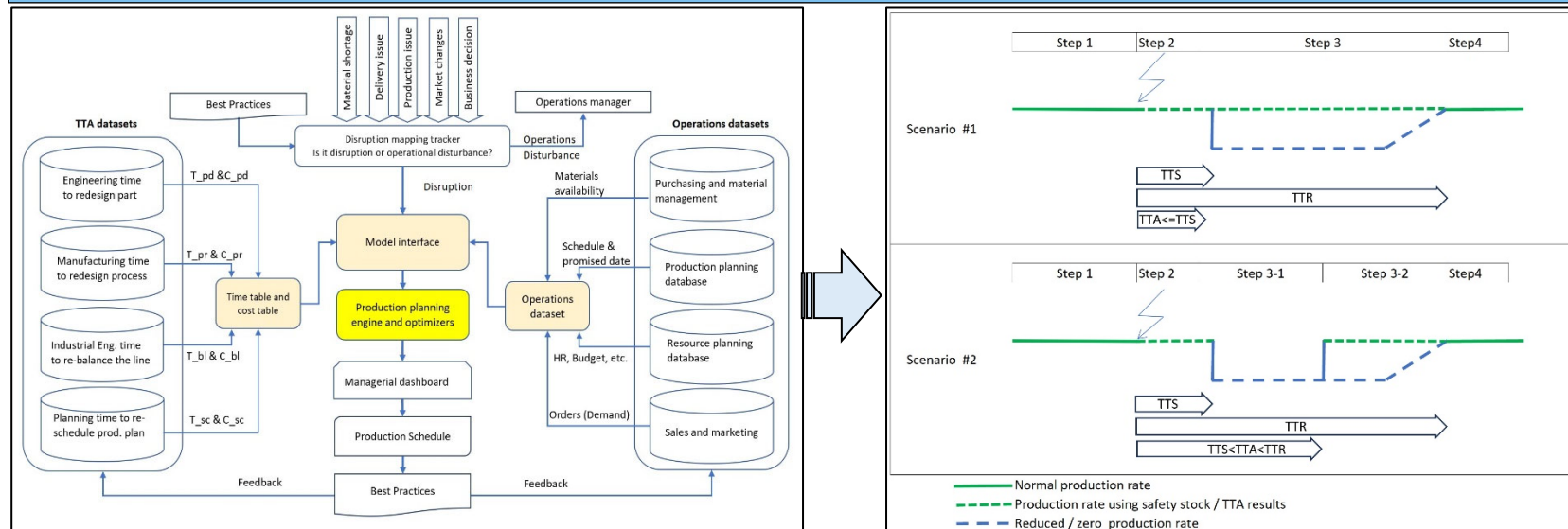# Time-to-Adapt (*TTA*)

TTR: Time-to-Recover is the time needed to restore full operational capacity after a complete disruption. Miklovic et al. 2010
TTS: Time-to-Survive is the maximum time a manufacturer can operate without performance degradation. Simchi-Levi et al. 2014, 2015, 2018
TTA: Time-to-Adapt is the time between the start of a disruption and the first implemented action supporting the continuity of production. Mohsen et al 2024

Time-to-Adapt; Supply chain Adaptability; Viability; Resilience, Mass customization.

Conclusion: *TTA* as an indicator, measures the time between the start of a disruption and the first implemented action supporting the continuity of production. Manufacturer manages internal controllable factors such as design, process, balance, and schedule to mitigate disruption impacts. As a strategy, it enhances resource capability for solving supply chain issues, offering temporary or permanent solutions.

ALTTEXT: Graphical abstract: The title is Time-to-Adapt (TTA). There are three definitions for the indicators. TTR: Time-to-Recover is the time needed to restore full operational capacity after a complete disruption. Miklovic et al. 2010. TTS: Time-to-Survive is the maximum time a manufacturer can operate without performance degradation. Simchi-Levi et al. 2014, 2015, 2018. TTA: Time-to-Adapt is the time between the start of a disruption and the first implemented action supporting the continuity of production. Mohsen et al 2024. The model contains five sections. Section 1 on the top presents the disruption mapping inputs including material, delivery, production, market, and business issues. Section 2 on the right shows all operations databases, including Purchasing, Production, Resources, and Sales. Section 3 on the left shows TTA datasets, including engineering, manufacturing, industrial engineering, and planners. Section 4, in the middle, contains the production planning engine and optimizers, which use the data from the interface module. Finally, section 5 is the management dashboard at the bottom of the model, which includes the production schedule, best practices, and feedback to the other sections. The result shows if *TTA* is less than *TTS* production can continue but it must be under surveillance (dotted line). However, if *TTA* is longer than *TTS* and less than *TTR* it would be downtime in manufacturing, but it would be helpful to continue production sooner than *TTR*. This production period also must be under surveillance (dotted line).