Building Resilience in the current Lean supply chains to minimize risk due to disruptions

Introduction: This thesis was carried out at Merten GmbH, a Schneider-Electric entity located in Wiehl, Germany. The supply chains are the interface of the business operations of any company. As the contemporary supply chains are global and interconnected, any risks occurring at one node of the supply chain cause complete failure leading to a significant loss in revenues. In the wake of the recent natural disasters, supply chains experienced failures because of their inability to procure raw materials from suppliers. These failures demand the need for fostering a resilient supply chain with enough resisting capacity to be safe from disruptions. As the business goals are to maximize profits by reducing costs, there is a need for the resisting measures to be cost-effective, i.e., Lean. The supply chain at Merten GmbH, which has become an incidence of similar supply risks, is looking for a proactive, flexible, and safe solution to fight the disruptions without hurting the economics of the supply chain.

Objectives: The main objective of this thesis revolves around answering the question, "How to make the supply chains more resistant and thereby resilient to avoid material shortages even during crisis times by still being Lean." With this thesis, the following are the research questions that were answered empirically:

- How can the supply chains stay resilient and lean amid the disruptions?
- How to contain the critical business from the effects of disruption?
- How can organizations improve the visibility of their supply chains?
- What are the strategies organizations can follow to manage multiple supply sources?
- What can organizations do to prevent disruptions from affecting the supply chain?

Methodology: The methodology used in the thesis can be represented by the Swimlane diagram, which was inspired by the works of Burrafato and Cossentino (2002). The Swimlane diagram accurately illustrates the process analysis implemented to bring resistance measures into current supply chains and hence was used as the primary framework. The structure of this thesis is organized to based on the Swimlane diagram, from the literature review to the case studies on imparting resistance in supply chains.
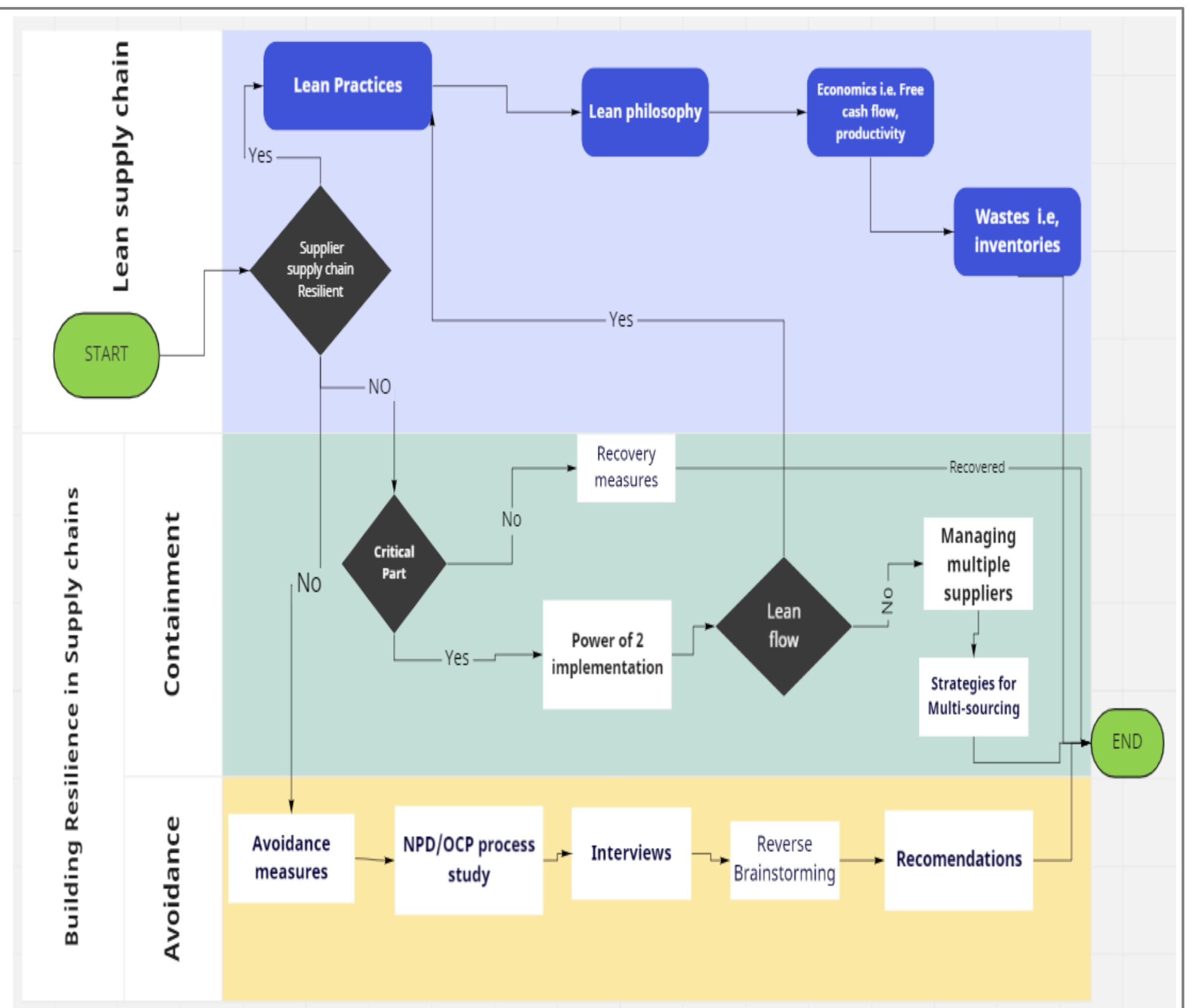

Figure 1: Swimlane diagram for methodology

Further Analysis: Resilience of the supply chain has two pillars, resistance and recovery. As recovery involves taking measures after a disruption occurs, to make the supply chains proactive, resistance measures need to be set up.
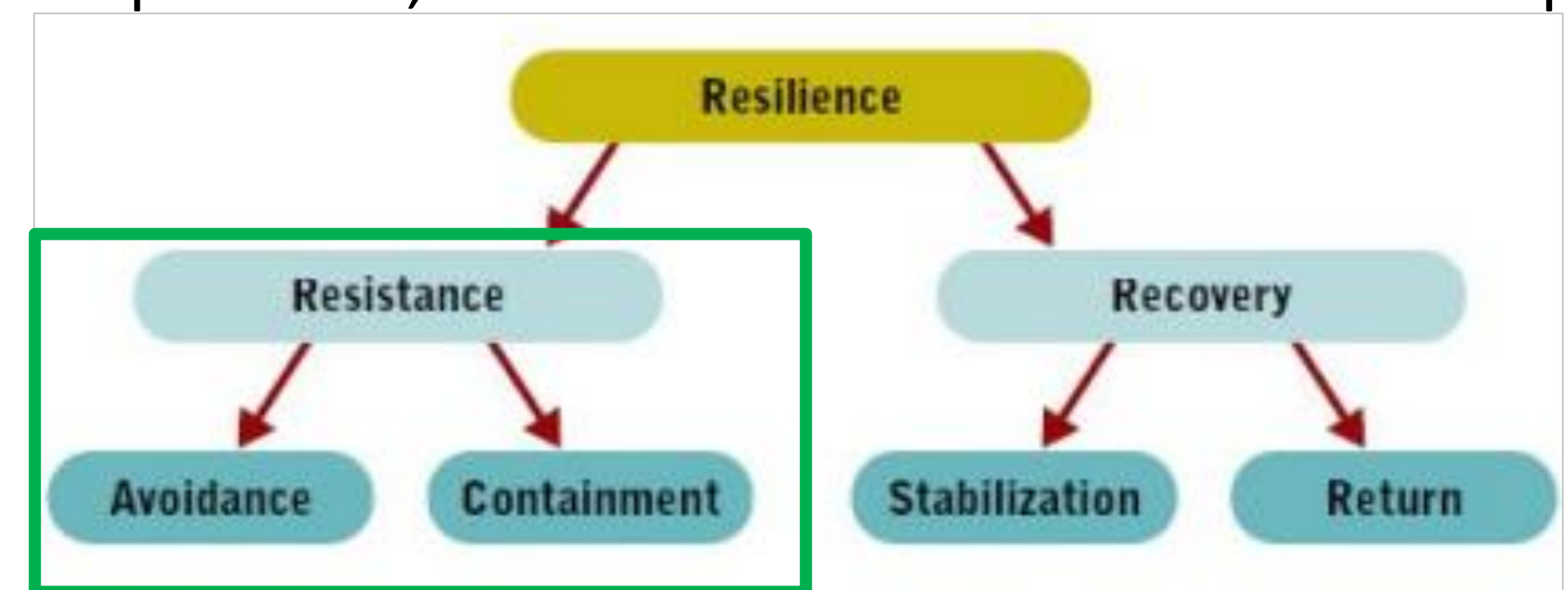

Figure 2: Tree of resilience in supply chain

With this thesis, strategies for implementing resistance measures were made at each of the pillars, containment, and avoidance. Under the pillar containment, to contain the disruptions from affecting the complete supply chain, a program called 'Power of 2' is introduced and is empirically implemented at Merten to improve the visibility of the critical parts. Business continuity is ensured even when the suppliers are affected by disruptions. With free cash flow being reduced, to improve the business profitability and keep the process lean, strategies for balancing the multiple supplies were drafted and implemented in Merten's business.

To avoid and ultimately achieve resistance from disruptions, the New Product Development (NPD) process at Merten is analyzed, and the solutions for eliminating the risk drivers were identified using a **reverse-brainstorming** approach to prevent the flow of risks into regular business.

References
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