

# Supplementary Material for: Starting Collaborations Between SMEs and Researchers in Software Engineering

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## Abstract

In software engineering research, academia-industry collaboration is predominantly understood as partnerships between academic institutions and large companies. Small and Medium-sized Enterprises (SMEs) are vital contributors to the industry, and they are numerous. Their unique challenges and settings differentiate their collaboration dynamics from larger corporations. We seek to identify guiding principles and practices for initiating collaborations between researchers and SMEs. Through a meta-synthesis approach drawn from two Systematic Literature Reviews, we introduce a collaborative model canvas. This emphasizes the importance of SMEs' business contexts and the relationships between researchers and SMEs. Our research offers insights for those looking to collaborate with SMEs, considering their challenges and limitations.

**Keywords:** collaboration, SMEs, software engineering

## The Collaborative Model Canvas

This supplementary material features the Collaborative Model Canvas, depicted in Figure 1, a framework designed to initiate and guide collaborations between researchers and Small and Medium-sized Enterprises (SMEs). Included are key practices essential for starting such partnerships. While the canvas highlights fundamental elements, its adaptable nature ensures it can be tailored to the specific circumstances and needs of individual research projects and SMEs

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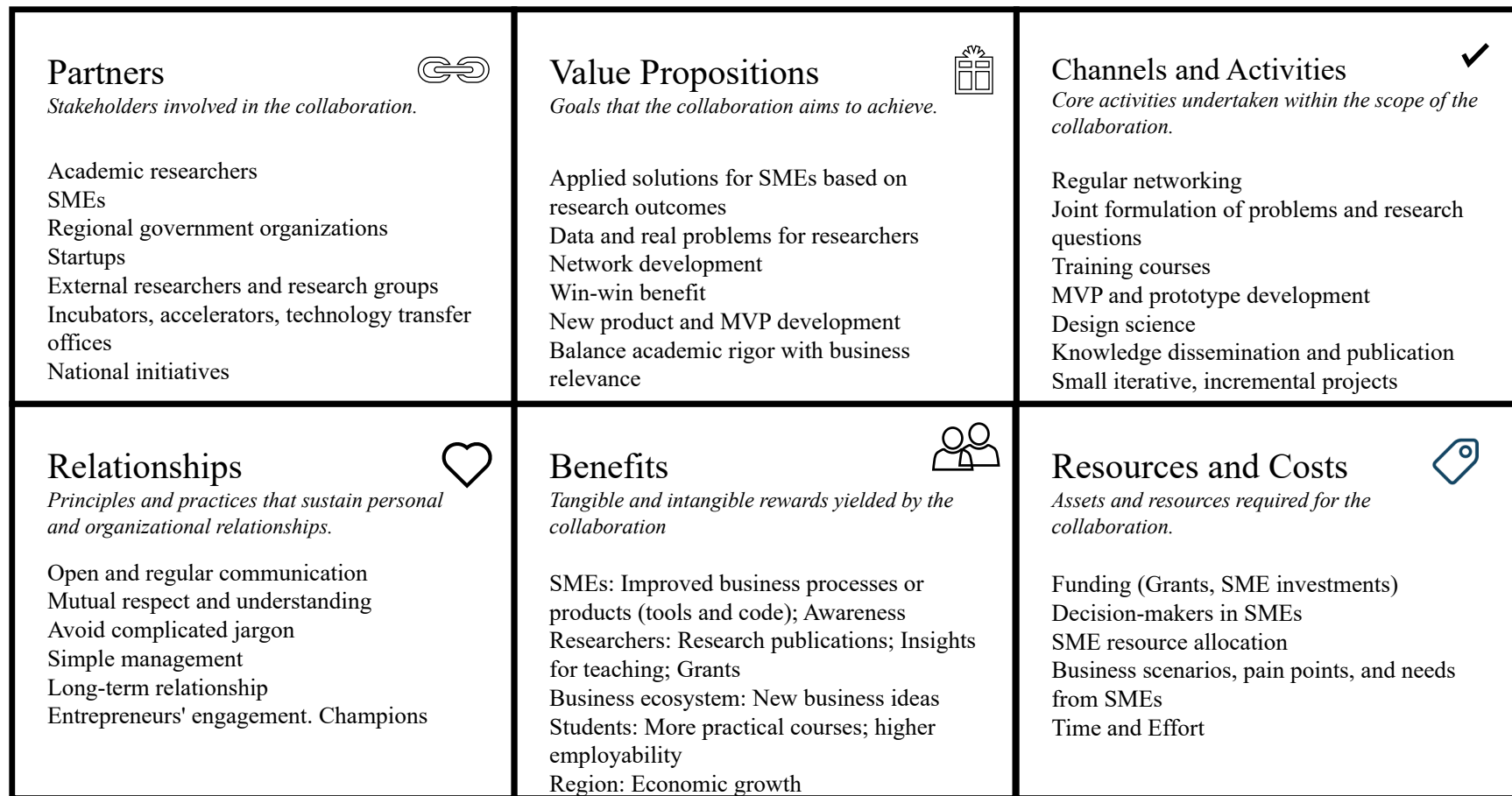


Figure 1: Collaborative Model Canvas with key components.

# 1 Key Practices for Starting

## 1.1 Partners

### Key Practices for Starting

**Stakeholder Mapping:** Map potential partners to identify unique strengths for a more effective collaboration.

**Alignment Workshops:** Hold workshops to synchronize goals and expectations, thereby minimizing misalignment risks.

## 1.2 Value Proposition

### Key Practice for Starting

**Quick Problem-Solution Matching:** Conduct streamlined workshops for SMEs and researchers to quickly align current projects with immediate business needs.

## 1.3 Channels and Activities

### Key Practices for Starting

**Develop personal relationships:** Researchers should aim to cultivate initial personal relationships with SMEs to build trust and set the stage for future collaboration.

**Guest Lectures:** Invite SME owners and managers for guest lectures to enrich course content and facilitate knowledge exchange.

**Co-Formulate Questions:** Conduct workshops to co-formulate research questions, ensuring that academic pursuits are directly aligned with real-world SME challenges.

**Regular Networking:** Set a regular schedule for networking events and seminars to maintain ongoing engagement and dialogue.

## 1.4 Relationship

### Key Practices for Starting

**Engage Champions:** Identify and onboard key stakeholders who are enthusiastic about and committed to the project early on.

**Feedback Loops:** Establish routine feedback mechanisms to identify what is working and what needs adjustment.

**Research transparency:** Maintain openness about research outcomes to manage expectations and avoid misunderstandings.

## 1.5 Benefits

### Key Practices for Starting

**Needs Scan:** Conduct a targeted assessment to ensure the collaboration serves the interests of all stakeholders.

**Stakeholder alignment:** Sync academic and business goals for mutual benefits, focusing on primary beneficiaries like SMEs and researchers.

**Community Outreach:** Engage the local economy and educational institutions to maximize the collaboration's broader impact.

## 1.6 Resources and Costs

### Key Practices for Starting

**Engage Decision-Makers:** Initiate early conversations with SME decision-makers to align needs and objectives.

**Funding Blueprint:** Develop a comprehensive funding strategy involving various sources, including grants and SME investments.

**Small and Continuous Iterations:** Adopt a strategy of small, incremental projects and ongoing iterations to minimize risks and costs.