Research Protocol

for constructing a Conceptual Framework and Mapping Regional Software Startup Ecosystems

*Developed in a collaboration between University of São Paulo and Technion (2013-2014)*

The examples below mention the first region in which this protocol was applied, Israel, but it was designed so that it can be repeated in any region.

**The team of researchers**

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**Major research study steps:**

1) Preliminary literature review
2) Data collection: Interviews and non-participative observation
3) Data coding and analysis
4) Constructing the Conceptual Framework
5) SWOT Analysis Questionnaire
6) Comprehensive bibliographic review
7) Putting forward Recommendations
8) Writing final report/paper about the research.

**1) Preliminary literature review**

Carry out broad study of the literature on

1. Entrepreneurship
2. Startup engineering
3. Innovation and the high-tech industry in the region under study (Israel)
2) Data collection: Interviews and non-participative observation

Interview preparation

Optional preliminaries (done in day 1, before setting up the interview date)
- If the interviewer and interviewee have the availability for multiple meetings, this preliminaries should be carried out: In the 1st meeting, try to know the people, observe the startup environment, and try to schedule an interview with 2 or 3 members of the startup team for a few days later.
- If this is not possible, then proceed directly to the interview without preliminaries.

The interview

- Explain the overall goal of the research in general terms:
  - GOAL: Study the Startup Ecosystem from a CS/IT perspective to obtain a better understanding of the current state-of-the-practice in Software Startups in Israel, identifying best practices as well as problems/difficulties and opportunities for improvement in Israel.
- Explain the basic procedure and ask if it's OK (if not, adapt to fit needs)
- Explain the reasons for recording and confidentiality
- Explain results will be sent first hand to them
- All results will be published in an anonymous form
  - except in particular cases in which it might be interesting to disclose the name of the person or company but only with explicit approval of the involved people.

Benefits for the startup:
- Simply mention quickly: “I hope it'll be the beginning of a fruitful collaboration”.
- If more details are asked, can offer:
  - Technical reports with results of the research will be sent first hand to them.
  - In many cases, such interviews clarify to the interviewees many issues related to their company since the interview provides the interviewees with the opportunity to take a time break and reflect.
  - If they're interested, we can provide a short assessment of what I observed in the company, including opportunities for improvement.

During the interview:

- Depending on the profile of the interviewee, some of the questions might be skipped or adapted (e.g., for a CEO with business background, we might adapt the questions about code quality; for a developer, we probably won't ask about investment).
- The researcher (interviewer) will make a few notes on paper or computer.
- The complete audio will be recorded.
Interviewee sample:
- Our goal is to reach around 20 startups.
- Whenever possible, we will try to seek some diversity in cultural origin, gender, race, religion, etc. in our interviewee universe.

Interview Duration: typically, 30 to 75 minutes

Background information
This is not filled by the interviewee, but instead, the interviewer collects this information before and after the interview.

Personal information (treated with confidentiality)
Name:
Email:
Age:
Degree of highest completed education:
  Area:
  Year degree was obtained:
Current job position:

Company (treated with confidentiality)
Name:
URL:
Domain:
Number of company employees:
How long ago was founded (age/months):
Stage of life (e.g., initial idea, self-funded startup, seed fund, VC funded, etc.):

Oral Questions
The questions below serve as a guide to the researcher (interviewer) who will adapt the language and the direction of the interview based on the real-time feedback from the interviewee.

This is not necessarily the order in which the questions will be asked. Interviewer will feel the person and adapt to what his intuition tells about it.

Last but not least, some of these topics have already been covered in books such as Startup Nation and Technion Nation. We don't want to repeat that; that's our starting point and we'd like to go further

1) What are the factors in Israel that foster/promote entrepreneurship?

2) What are the institutional mechanisms in place in Israel that promote entrepreneurship?
   - legislation
   - educational, scientific and technological institutions
   - government (national, municipal and local) agencies/programs
   - seed funds, angel investment, VC
   - NGOs
3) Do you believe education has a significant role in entrepreneurship? At home? Fundamental school? Middle School? University? Self-education? Informal? Overall education or entrepreneurship-specific education? Can you think of explicit or implicit pedagogical material and mechanisms that nurtures the entrepreneurial spirit?

4) What are the characteristics of entrepreneurs? What are the characteristics of successful innovative teams? (mix of introverts and extroverts?) What are the roles of different kinds of people? Is diversity important? What is the prime motivation of the high-tech entrepreneur: wealth, fame, self-esteem, proof of technology etc.?

5) Which and how technological aspects influence the success of software startups? In particular, what is the role played by Object-Orientation, Languages, Frameworks, Patterns, Models, and Architectures? Does your team has a concern for code quality? How do you promote and control that? Do you have a large technical debt? Do you manage that in any way?

6) Which and how methodological aspects influence the success of software startups? In particular, what is the role played by Agile Methods, Lean Startup, Customer Development? Which agile methods practices do you use? Is there something in agile methods that doesn't work very well for your company? Do you consider a systemic plan or the intuition being the dominant success trigger of start-ups? Is this relation changing along the start-up life? What don't you do very well and would like to do better?

7) What's the relationship of your company with Open Source software? Do you use it? Do you contribute? Do you believe open source has a significant role in the startup ecosystem?

8) If you had to name 4 key elements for a healthy startup ecosystem in a country or region, what would them be?

9) Do you have any question to me or see any ways in which we can collaborate?

3) Data coding and analysis

After each interview:

- Researcher will iteratively produce a working document (ResearchQuestionNotes.odt) structured around the initial research questions.
- For each research question, researcher writes notes based on the answers by interviewees on related topics.
- Interviewer (and, whenever possible, other researchers participating in the study) listen to the recorded interview, coding the collected data, analyzing it and registering the partial findings.
- Relevant sentences from interviewees are included in the ResearchQuestionNotes.odt document as well as observations from researcher.
- All notes are tagged with the name of the interviewee.
- Colors are used to identify the researcher who makes the notes.

4) Constructing the Conceptual Framework
• Based on the coded information, a Conceptual Framework will be iteratively created.

• Each time a new significant element or concept is introduced, the Conceptual Framework is extended to include it.

• Each time a new relationship is mentioned among the elements, it is included in the framework.

• The labels in the arrows characterize the type of relationship represented by them.

• Only elements and relationships that were explicitly raised in the interviews are added.

• Continuous arrows denote relationships that were observed all, or almost all, of the times, while dotted arrows denote relationships that were observed only part of the times.

• At regular intervals (e.g., once per month), the Conceptual Framework is shared with all researchers in the team and discussions about refining and improving it are carried out.

• The Conceptual Framework and the collected information will serve the basis for papers, new research proposals, and Teaching Material on Startup Engineering for IT students.

5) SWOT Analysis Questionnaire

In order to collect additional information from experts in the field, an online questionnaire with questions for a SWOT analysis is sent to people with over 10 years of work experience on startups and entrepreneurship and who has worked with at least 2 different startups.

The full questionnaire is available at:
https://docs.google.com/spreadsheet/viewform?usp=drive_web&formkey=dE5zWUITbFVFWhdmS05TEd1VkJU4S3c6MA#gid=0

The answers are compiled and grouped to identify what are the elements that are more frequent among the expert respondents.

6) Comprehensive literature review

After the conceptual framework is constructed, a more comprehensive literature review is conducted, this time also including related work on ecosystems, models, and frameworks. This was not done a priori not to bias the construction of our conceptual framework, which should emerge from the data.

Information collected in this phase will be instrumental in devising the Recommendations and for writing the final paper reporting the research findings.

7) Putting forward Recommendations

Based on the Conceptual Framework, analysis of the interviews and observations, SWOT questionnaire, and the literature review, put forward recommendations for the major stakeholders in the ecosystem, in particular for Entrepreneurs and for Policy Makers.
8) Writing final report/paper about the research

All researchers from the team are invited to work collaboratively on a document presenting the results of the research. A preliminary version is produced and shared with members of the ecosystem for feedback; in particular, all interviewees and respondents of the SWOT questionnaire are invited to provide their feedback. Finally, a refined version of the document is produced and submitted for publication.