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Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Maksim Malyy

PhD Program: Engineering Systems

Title of Thesis: The data-driven model of technology-based new ventures growth

Supervisor: Associate Professor Zeljko Tekic, HSE University

Name of the Reviewer: Professor Vincent Mangematin

I confirm the absence of any conflict of interest (Alternatively, Reviewer can formulate a possible conflict)	**Date: 16 Feb 2022**

The purpose of this report is to obtain an independent review from the members of PhD defense Jury before the thesis defense. The members of PhD defense Jury are asked to submit signed copy of the report at least 30 days prior the thesis defense. The Reviewers are asked to bring a copy of the completed report to the thesis defense and to discuss the contents of each report with each other before the thesis defense.

If the reviewers have any queries about the thesis which they wish to raise in advance, please contact the Chair of the Jury.

Reviewer's Report

Reviewers report should contain the following items:

- Brief evaluation of the thesis quality and overall structure of the dissertation.
- The relevance of the topic of dissertation work to its actual content
- The relevance of the methods used in the dissertation
- The scientific significance of the results obtained and their compliance with the international level and current state of the art
- The relevance of the obtained results to applications (if applicable)
- The quality of publications

The summary of issues to be addressed before/during the thesis defense

Comments of Maksim Malvy's thesis, " THE DATA-DRIVEN MODEL OF TECHNOLOGY-BASED NEW VENTURES GROWTH", Feb 2022.

The thesis of Maksim Malvy, supervised by Associate Professor Zeljko Tekic is entitled " THE DATA-DRIVEN MODEL OF TECHNOLOGY-BASED NEW VENTURES GROWTH". This is a 200 pages document including appendixes.

The thesis explores a central research questions : *how do technology-based new ventures grow?* This research question is divided into two sub research questions: "Which data of a TBNV can demonstrate its growth?" and "How does the trajectory of TBNVs growth change over time?".

The first chapter positions the thesis within the organization life cycle literature. It introduces an historical perspective to discuss the required amendment to the literature. The first essay explores the growth related sources of information. It introduces three main components: web search traffic, platform Vs. non platform and B2B Vs. B2C and it tests the different components on a sample of 241 US tech start-ups.

The second essay aims to characterize TBNVs growth trajectory. It proposes to model the exponentially accelerated growth starting point on this TBNV's growth trajectory. The last chapters conclude and emphasize the contributions

- Value of the retrospective analysis
- Possibility to model the growth
- Modelling of the q-point
- Identification of a new data source

The proposed thesis is interesting and well structured. I would like to comment the thesis around four main points:

1. Why Organization Life Cycle so central?
2. How can we analyze the correlation with Google trends
3. Data analysis
4. contribution

Why Organization Life Cycle so central?
The thesis aims at contributing on the organizational life cycle. This theory is an important one. However, it brings several questions:

- The reason why for choosing this approach remains unexplored. Why this approach rather than another one to explain the growth of TBNV? Which could have been the other alternatives?

- Emerging TBNVs are usually digital and based on multisided markets. The organization life cycle has been developed far before the emergence of digital platforms. To what extent is the approach adapted to describe the evolution of platform new venture.

- One of the hypotheses behind the OLC is that the evolution is not chaotic. Considering the actual trajectory of TBNV, this hypothesis needs to be addressed

- Boundaries of organization. One of the central hypotheses of the OLC model is that the boundaries of organization are well-defined and given. Recent evolutions show that the boundaries are fuzzy and questioned. The notion of ecosystem blurs the boundaries of the firm and weakens the interest of OLC as it becomes less relevant to analyse the firm per se compared to the whole development of eco-system.

How can we analyse the correlation with Google trends

The finding of the correlation is interesting. Considering the methodology with 6 rounds of founding and the proportion of platform and B2C, this is not surprising. What does web search traffic mean and what does it represent? When a start-ups is becoming unicorn, it drives more visibility and traction. How to interpret the correlation and to what extent can we infer causality?

Data analysis

Chap 3. It is surprising that data analysis is sequential rather than building an integrated model. In addition you have longitudinal data and you analyse it as cross section. Without being a specialist in econometrics, it is surprising.

Chap 4. Your sample selection process p 99 may introduces a bias as you selection first data available in Google trends and with enough points. You introduce after different dimensions as Unicorn etc. controlling how the sample is reduced is important.

Contribution

Your intellectual project is to better understand *how do technology-based new ventures grow.* The parti pris of your argument is that Organisation Life Cycle is the relevant concept to amend to this aim.

Your first paper introduces web search traffic as an additional variable to follow for describing growth. However, what is beyond correlation remains fuzzy.

Your second paper better calibrates the S curve and the q-point.

These are two important contributions. However, basic questions remain open: is OLC the relevant conceptual tool to describe TBNV's growth? Is it relevant when ecosystems are becoming more important? Which are the competing concepts to describe growth? what is the explanatory power of OLC?

To sum up, the intellectual project of the thesis is interesting and deserves to be discussed during the defense. I approve the defense of the PhD dissertation

In Marseille, Feb 15th, 2022

Professor Vincent Mangematin

Provisional Recommendation

X *I recommend that the candidate should defend the thesis by means of a formal thesis defense*

☐ *I recommend that the candidate should defend the thesis by means of a formal thesis defense only after appropriate changes would be introduced in candidate's thesis according to the recommendations of the present report*

☐ *The thesis is not acceptable and I recommend that the candidate be exempt from the formal thesis defense*