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Skolkovo Institute of Science and Technology

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: Dmitry Koroteev

I confirm the absence of any conflict of interest	Date: 14-02-2022

Reviewer's Report

Maksim's thesis discloses a model to predict the growth of technological new ventures. Maksim used google trends to assess the data on the development of 241 new ventures from the US and examined their growth trajectories.

The thesis is of good quality and is structured very well. The topic of the thesis is absolutely relevant to its content.

Maksim used curve shape analysis to derive the "best fit" curve for his data. This is one of the classical ways of getting the proper analytical estimate/data approximation. The method is relevant to the problem.

Assuming two Q1 publications, the results are significant in the area of innovations research. The publications are of high quality, and there is no doubt that they cover the major outcomes of the research and make it available for a broad audience of professionals in the area.

The obtained results are relevant to the real-world tech companies' valuation problem.

I see two major issues to be addressed before the defense.

1. I would like to see a much wider discussion on why the author selected S-curve to approximate the data. It is rather clear that the S-curve is a robust and straightforward way of fitting the non-huge dataset. Still, it seems like there could be some conventional machine learning (ML) techniques that can handle the dataset more precisely. I am not talking about Deep Learning here, just simple regression models, random forests, support vector machines, and similar. Moreover, some classical ML methods allow the non-trivial analysis of the feature importance for the final prediction. So, if the data on the companies is a bit richer than what google trends provide, there is an option for detailed analysis on what makes the companies successful. I encourage Maksim to comment on this.

2. It is absolutely clear and is confirmed by the author that the developed model is applicable for US only. I would like to ask Maksim to provide some ideas on what to do with the evaluation of the growth in the EU, MENA, Russia, China, India, Singapore, Australia, and other tech hubs.

Provisional Recommendation

☒ *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*