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OPPONENT'S OPINION

Doctoral thesis: Social capital and industry 4.0 readiness: Role of Innovative capability, Industry 4.0 efficacy, and knowledge based dynamic capabilities
Author: Najam Ul Zia
Degree program: Economics and Management
Degree course: P6208 Economics and Management

1. Topicality of the dissertation thesis

The dissertation deals with a current topic from the perspective of developing countries. The student correctly identified the research gap on which he subsequently oriented his scientific research. The technological readiness of industrial companies is the content of the introductory part of the dissertation. In the introduction, the student thus demonstrated the ability to systemically understand the essential links in the given topic. The thematically essential part of the work is the literary analysis. It is clear from it what the current state of research is in the selected area. At the same time, it points to the complexity of linking research through clearly defined dimensions: structural, relational and cognitive.
Despite the fact that the presented research is limited only to Pakistan, the proposed methodology acquired an objective dimension by the fact that the student incorporated the opinions of managers from several countries. The overall result of the methodology proposed by the student is, for the stated reason, applicable to a wider range of companies that are seriously interested in the implementation of Industry 4.0.

2. Fulfilment of the goals set in the dissertation thesis

The main goal is set in chapter 3 as a combination of social capital theory and knowledge based dynamic capabilities. Based on literary research, the student identified 8 hypotheses that are compatible with the literature search and questionnaire survey in terms of content. I consider it correct that a student used mixed-method approach and empirically examined the roles of innovative capability, i4.0 efficacy, and KBDCs. Path analysis, presented in figure 3 identifies clearly the mathematical and statistical methods used for processing research data. Results of quantitative studies presented in chapter 5 exactly demonstrate the reliability and validity of selected parameters. Using selected statistical methods, the student verified individual scientific hypotheses within permissible limits (a comprehensive view of the tested hypotheses is presented in table 7). Qualitative results of research confirmed the link between structural social capital and innovative capability.

3. Procedure for solving the problem and the results of the dissertation, indicating the specific contribution of the student

The content of the research was to verify the relationship of social capital in relation to i4.0 readiness. The procedure that the student chose to demonstrate the connections between structural and relational social capital clearly defined the scope of knowledge-based dynamic capabilities. The setting of scientific hypotheses, the statistical processing of the results of the questionnaire survey proved the relevance of the chosen procedure. The results of dissertation thesis showed that firms in developing economies with a strong organizational structure of shared norms, values, and languages are in a better position to acquire the desired technical knowledge from firms in developed economies according the implementation of Industry 4.0 concept.

4. Significance for practice and for the development of the scientific field

The student exactly in his dissertation identified the potentials for companies – a higher concentration of companies on social capital and knowledge-based orientation. Adequately used knowledge from the literature to set a targeted research problem. Companies have a number of questions related to the implementation of Industry 4.0. In dissertation thesis student demonstrated, on the basis of a correctly identified research gap, that it is absolutely necessary to give attention to the knowledge associated with the efficacy of Industry 4.0 problems. He also pointed to the need for further research in the field of digital transformation of companies with the aim of strengthening innovation capability. As stated in the conclusion of the dissertation thesis, in the future it will be necessary to connect knowledge from several countries and to investigate in depth the sources that influence the effectiveness of social capital.

5. Formal preparation of the dissertation and language level

The formal arrangement corresponds to the requirements for this type of work and the work has an adequate language level.

6. Publication activity of the student

The list of student publications includes 6 published articles, 5 publications under review and 6 conference proceedings. Thematically, all publication outputs are focused similarly to the topic of the dissertation thesis.

CONCLUSION

The dissertation thesis "Social capital and Industry 4.0 readiness: Role of Innovative capability, Industry 4.0 efficacy, and knowledge based dynamic capabilities" – student Najam Ul Zia – meets the requirements for the mentioned type of qualification thesis and therefore
-   **I recommend –**
this dissertation thesis for defence. After a successful defence, I recommend the Ph.D. degree for Najam Ul Zia.

Defence questions:

1. What do you mean by "resources integrated into the network of connections" (p. 12)? How do they contribute to added value within Industry 4.0 concept in company?
2. In the case of strengthening innovation capability, is there a radical change in the structure of social capital? If so, in what direction from the point of view of management and organization of company processes?
3. What key outcomes of i4.0 readiness does you expect to research in the future research activities?