Defining the strategy for the professional development of a mechanical engineer

UDK **539.3**

Kryvova Svitlana Georgievna

Ph.D,

Associate Professor of Dynamics and Strength of Machines and Strength of Materials Department

National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"

skrivova@ukr.net

Trubachev Serhii Ivanovich

Ph.D,

Associate Professor of Dynamics and Strength of Machines and Strength of Materials Department

National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"

strubachev@i.ua

Introductions. In the modern dynamic world, defining a professional development strategy becomes a key element of a successful career for a mechanical engineer. The rapid advancement of technologies and the emergence of new approaches require the mechanical engineer to continuously deepen and update their knowledge for successful competitiveness in the job market.

Aim. The aim of the work is to create a systematic strategy for the professional development of a mechanical engineer, considering the individual characteristics of the engineer and the requirements of the modern job market.

Materials and methods. The following research methods were employed in the study:

- Literature analysis: review of scientific articles and publications to enrich the theoretical foundation regarding strategies for the professional development of mechanical engineers.
- Expert surveys: conducting surveys among experienced mechanical engineers and company managers to obtain practical advice and real examples of successful professional development strategies.
- Statistical data analysis: investigating labor market data to identify trends in the qualifications required for mechanical engineers.
- Case analysis: studying specific cases of successful careers of mechanical engineers to identify specific strategies that led to their success.
- Monitoring market trends: observing changes in industry requirements, the adoption of new technologies, and labor market developments to adapt the strategy to current realities.
- Comprehensive competence analysis: evaluating existing and potential competencies of mechanical engineers to determine the most promising development directions.
- Synthesis of results: formulating a systematic strategy for the professional development of mechanical engineers based on the synthesized findings.

This comprehensive approach enables the derivation of objective and practical conclusions regarding the optimal strategy for the professional growth of a mechanical engineer.

Results and discussion. Among the relevant professional competencies of a mechanical engineer, the research identified the following:

- Knowledge of software products: the results indicate the critical importance of mastering modern engineering software such as SolidWorks, AutoCAD, ANSYS, which are crucial for solving design and calculation tasks.
- Analytical skills: the analysis shows that a mechanical engineer must possess a high level of mathematical and physical knowledge for successful calculations and analysis of mechanical systems, including methods for investigating the structure and motion of mechanisms and machines, approaches to their design.
- English language proficiency at a level not lower than Elementary.

As for the relevant personal competencies of a mechanical engineer, the following can be considered:
- Communication skills: a successful mechanical engineer must have a high level of communicability for effective collaboration with a team and clients.
- Systems thinking: the results confirm that the ability for systems thinking is crucial for solving complex engineering problems and predicting the impact of decisions on the entire mechanical process.
- Leadership qualities: the research indicates the importance of developing leadership skills, such as initiative and decision-making ability, for successful participation in project tasks and further career development as a project manager or systems engineer.

The research results suggest that a successful mechanical engineer needs to possess both professional and personal competencies for effective work in the modern technological environment. Collaboration between professional and personal development is necessary to achieve a high level of qualification, adapt to changes in the industry, and enhance competitiveness in the job market.

Based on the conducted research, a systematic strategy for the professional development of a mechanical engineer can be defined, involving the following directions:

1. Analysis of needs and trends: regular self-assessment and exploration of trends in mechanical engineering to understand the current demands of the job market.

2. Continuous improvement: involvement in a continuous learning process through participation in courses, workshops, and online platforms to update knowledge and master cutting-edge technologies.

3. Development of professional skills: focus on expanding professional skills, particularly improving the use of software products (SolidWorks, AutoCAD, ANSYS) and enhancing calculation skills.

4. Language proficiency development: improvement of English language proficiency, supported by relevant certifications.

5. Networking: participation in professional communities, conferences, and networking events to establish connections and exchange experiences with other experts.

6. Personal development: concentration on developing personal skills, such as communicability, leadership qualities, and systems thinking, essential for collaboration and project management.

7. Mentoring and career development: engagement in mentoring support to receive advice from experienced colleagues and the development of a career plan to achieve long-term goals.

8. Project involvement: participation in real projects and tasks to gain practical experience and enhance skills in real conditions.

9. Results evaluation: regular assessment of the results of personal professional growth to make adjustments and adapt the strategy according to changes in personal goals and job market requirements.

It is evident that a systematic strategy for the professional development of a mechanical engineer should be individualized, oriented towards market needs, and consider development as a complex and integral process.

Conclusions. Defining a professional development strategy for a mechanical engineer is a critical step in supporting their success in the contemporary technological environment. An effective strategy should be systematic, integrating both professional and personal competencies. Continuous learning, the development of professional and leadership skills, as well as the establishment of a network, are the cornerstones of successful professional growth. Flexibility, adaptability, and continuous improvement are key principles that enable a mechanical engineer to maintain a high level of competitiveness and achieve new heights in their career.

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