

BRIDGING THE ACADEMIA-INDUSTRY GAP IN IT: A COMPETENCY-BASED RECOMMENDER SYSTEM ARCHITECTURE

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In today's fast-paced technological landscape, the disconnect between academic preparation and real-world IT demands is increasingly evident. This research proposes a competency-based recommendation system architecture, underpinned by the European Competence Framework (e-CF) and supported by principles of personalized learning [1]. The system addresses the need to bridge educational gaps by analyzing a student's acquired competencies against the requirements of targeted IT roles.

Utilizing IDEF0 functional modeling (Fig. 1), the architecture clearly defines system components and processes - mapping existing competencies, identifying gaps, and recommending a minimal set of courses to close those gaps. This process dramatically reduces the time and effort traditionally required for manual mapping, which can span days or weeks, down to minutes or hours with automated precision.

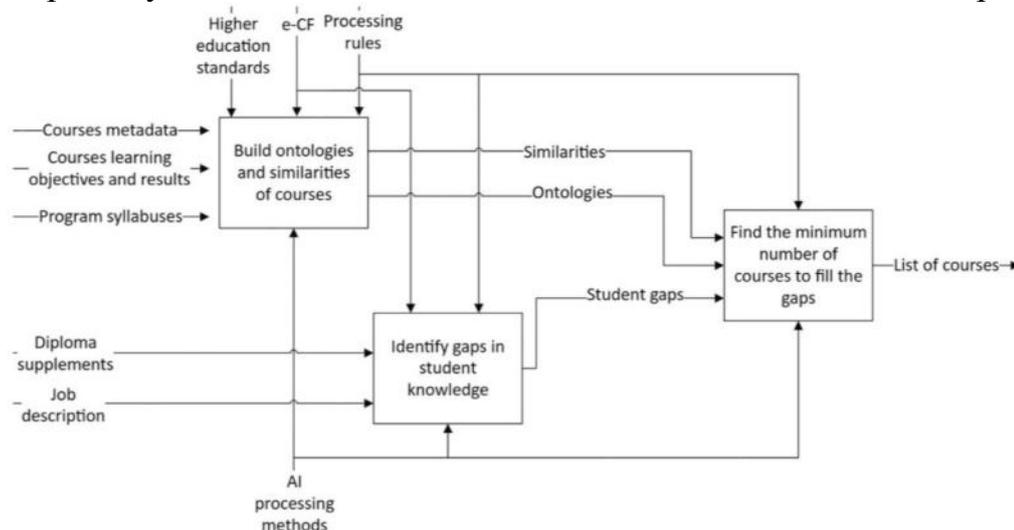


Fig. 1. - Diagram of the Recommendation System

The model aligns with the findings of Garousi, Giray, Tuzun, Catal and Felderer [2], who emphasized the importance of closing the gap between software engineering education and industrial needs through dynamic, project-based, and personalized learning paths. The system empowers students to pursue tailored upskilling while helping universities refine their offerings and employers identify near-ready candidates with ease.

References:

1. Alamri H., Lowell V., Watson W., Watson S. L. Using personalized learning as an instructional approach to motivate learners in online higher education: Learner self-determination and intrinsic motivation // *Journal of Research on Technology in Education*. – 2020. – Vol. 52, No. 3. – P. 322–352. – DOI: <https://doi.org/10.1080/15391523.2020.1728449>.

2. Garousi V., Giray G., Tuzun E., Catal C., Felderer M. Closing the Gap Between Software Engineering Education and Industrial Needs // *IEEE Software*. – 2020. – Vol. 37, No. 2. – P. 68–77.