

**MAPPING OF SOFTWARE ENGINEERING EDUCATION TO
SOFTWARE INDUSTRY DEMANDS IN PAKISTAN**



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Abstract

Software engineering education helps to provide the necessary skills and knowledge to the students. However, due to rapid changes in technologies, industry demands are changing continuously and fresh software engineering graduates find it difficult to obtain jobs. Which create gap between software engineering education and software industry. The aim of this study is to know the recent demands of the software industry in Pakistan and map it to software engineering education to find gaps. This study was conducted using qualitative interviewing and Ethnographic Content Analysis of the software engineering curriculum. In which several gaps were identified such as there was nothing mentioned about latest web development frameworks and technologies, IOS application development, teamwork etc. further, it is also concluded that software industry complained about several topics, which were present in software engineering but fresh graduate are not fully equipped with them. This arises another problem that can be flaws in teaching methodology or other issues that need research to highlight. Several recommendations were given by software industry to overcome these gaps. In which internships or industrial experience, seminars, workshops, alignment of curriculum according to industry demands and industry visits were considered important recommendation of software industry. We analyzed the curriculum of three national and international universities. In international universities, we found industrial experience, seminars, workshops and extracurricular activities, which are recommended by the software industry in Pakistan to include in the software engineering curriculum. Based on the study result, we presented our recommendations. If the recommendations of the study are followed by universities in Pakistan, the gap can be reduced. This study will help universities to improve their curriculum and industry will find the student with sufficient skills that will reduce the burden of extra training.

Dedication

Dedicated to my parents and teachers who supported me in all walks of life.

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Abbreviations

ACM	Association of Computing Machinery
IEEE	Institute of Electrical and Electronics Engineers
IT	Information Technology
ITES	Information Technology Enabled Services
HEC	Higher Education Commission
ICT	Information Communication Technologies
R&D	Research and Development
NCRC	National Curriculum Revision Committee
GDP	Gross domestic product
PSEB	Pakistan Software Export Board
CMMI	Capability Maturity Model Integration
ISO	International Organization for Standardization
APTICA	Asia Pacific Information and Communication Technology award
ERP	Enterprise resource planning
CRM	Customer relationship management
MOU	Memorandum of Understanding
CAQDAS	Computer-assisted qualitative data analysis software
KPIT board	Khyber Pakhtunkhwa Information Technology Board
UTM	University Technology Malaysia
NUST	National University of Science and Technology
SDLC	Software Development Life Cycle