

A Study By The IEEE Says Software Engineering Education Should Shift to Address the Startup Industry

The academic approach to software engineering education needs a jolt of future-focus to address the startup industry.



Providence, Jul 1, 2019 (Issuewire.com) - An analysis of the software engineering program curriculum aimed at benefiting the startup industry finds that software engineering as a discipline will play a vital role in the growth of engineering at startups. The study notes that software engineering programs do not adequately address a significant segment of the technology industry, i.e., startups.

NM Devadiga, lead author of the paper and a senior member of the IEEE, says in the paper published in the Conference of Software Engineering Education that particular topics in software engineering education today have drifted from the software development practices adopted in technology-oriented companies. "Early stage startups don't have the time and resources to invest in hands-on training activities and thus requires employees who can start contributing immediately and have the knowledge and experience to comprehend the existing systems and methodologies," says Devadiga.

The current standard curriculum in even the top-tier software engineering programs in school places little emphasis on the dynamics of the startup industry. The accepted curricula based on the software engineering book of knowledge provides students with valuable industry skills, which are a great asset in organizations which follow the formal software development structure.

Established organizations have structured training plans and invest heavily in getting new engineering graduates to get up to speed with their practices, such that software engineering graduates fit right in as it charts well with the education they have received, which Devadiga says are crucial. However, startups demand a dynamic and agile set of skills to identify, conceptualize, and deliver features per market needs rapidly, and the current curriculum is not sufficiently addressing this market.

"Given today's investments in startups, the need for cross-sector collaboration between academia and industry is only going to increase," says Devadiga.

For this study, interviews were conducted with the members of the startup engineering community, founders, senior engineers, and members of the academia. Their analysis led them to identify specific critical themes related to startups, as well as factors that they identified as being essential to building a successful curriculum geared towards startups. For the analysis and data collection, business and engineering characteristics of startups such as products vision, strategy, time-to-market, limited resources, application development process, team roles, product documentation, infrastructure, and DevOps were considered.

The study identified that the software engineering curriculum provides students with varied backgrounds the ability to understand the development of software from its initial phase to product deployment. However, there is a significant emphasis on strict adherence to the software processes, software estimation, analysis of software artifacts and not enough on topics such as application design and code structure to write clean, reusable and scalable code to build those architectural components, code reviews, DevOps and cloud computing.

"We found all collaborative efforts by the community to be extremely valuable," Devadiga says. "The goal here is to identify ways to make these programs even better moving forward. Software engineering and software development form the core foundation of startups. To be able to contribute to software development strategies of startups with scientific and engineering approaches, the first step is to comprehend the startups existing behavior. We studied multiple attributes of startups and then identified gaps in the current state of software engineering education, which can be used as a starting point to understand and build a more relevant industry-focused curriculum."

The study "Software Engineering Education: Converging with the Startup Industry" was published at the foremost meeting for software engineering educators worldwide, at the Conference of Software Engineering Education and Training.

This study can be viewed [here](#).

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