Thesis Title: Understanding Third-party Package Ecosystem Discussions Through Question-and-Answer Sites

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Abstract:
Third-party packages have become an integral part of modern software development, as developers have access to many useful packages immediately through the packaging ecosystems. Managing third-party packages is one of the major challenges of the package ecosystem due to its high degree of interdependence. In addition, it is hard for developers to understand the cost-benefit trade-offs when choosing package ecosystems. Question-and-answer sites are popular knowledge source to communicate developer's challenges.

This thesis investigates third-party package related discussion through popular question-and-answer site such as Stack Overflow to better understand the developer's experience (i.e., cost and benefits) in different ecosystems.   The main contributions of this thesis are divided into two parts. In the first part, developer's experience in package management is investigated, and found that developer discussion topics vary by package ecosystem. The results also indicate that certain features (e.g., dependency tree, environment, etc.) of package management correlate with the developer's experience. In the second part, the investigation of package usage shows that developers experience various errors when maintaining third-party packages. An analysis of the accepted answers related to package usage reveals that the answer, including usage examples and execute commands, helps resolve errors related to package usage.

In all, this thesis sheds the spot light for developers, package ecosystem designers and the research community the areas of package ecosystem issues that are challenging.