Other Related Work

There is a big number of frameworks addressing some of the problems mentioned in this paper. However, none of them covers the topic of customization. *Jaxer* [2] and *Phobos* [3] are web development frameworks that use the same set of Java/JavaScript-based languages for both browser and server thereby addressing the language heterogeneity problem. *Greasemonkey* [12] and *NoScript* [14] are extensions that allow the Firefox browser to locally customize the way a web page is rendered. These browser extensions are restricted to (1) the Firefox browser, to (2) JavaScript operations and (3) to web pages that are already delivered to the client. Customizations can only be shared via an external third channel, not via the web application itself.

In contrast, server-side application development is achieved by App2You [1], a graphical framework that allows users to create form-oriented web applications by outlining the pages of the application. The framework does not require programming experience or knowledge of web technologies. Our notion of customization is different from App2You's view of creating customized web applications: applications are derived from templates (App2You) instead of customized after deployment (SAFE). SproutCore [4] is a framework for web applications having the business logic on the client side. SproutCore aims at availability and efficiency of client code, in particular for mobile devices that are not connected to an application server. As in SAFE, updates to HTML and CSS code are performed automatically. Hanus and Koschnicke have recently presented a framework [11] to support the development of web applications based on an entity-relationship model. As for SAFE, this approach ensures application state consistency. Applications are specified in the declarative modeling language Curry which provides a strong typing machinery. However, many programmers consider functional languages such as Curry cumbersome to use for web application.

6. CONCLUSIONS

We have presented SAFE, a new activation-based CASE framework for the development of web applications with support for safe extensibility and concurrency. SAFE not only eases the development of web applications tremendously, but also ensures certain security properties by design. We have implemented a prototypical compiler for SAFE and have modeled a course management system in SAFE. Our framework shows the efficacy of the first steps into a novel interesting direction.

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