salesforce partner

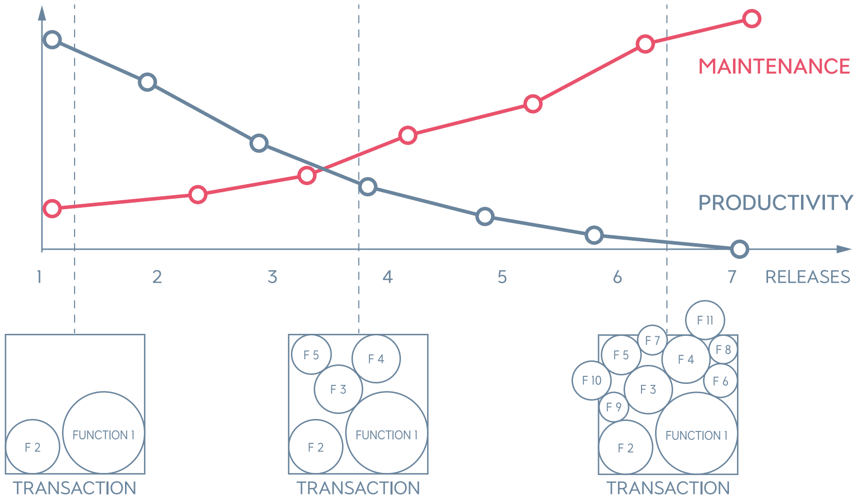
Case Study

Improved system productivity through refactoring

britenet

It is very often in IT systems that as the number of features increases, it also becomes more difficult to add new ones. The system becomes more and more difficult to maintain and develop, and maintenance costs begin to exceed the costs of introducing new features.

The following figure shows the relation mentioned above.



Such situations are usually a very bad sign indicating large problems in the system. One way to improve productivity is to introduce a refactoring phase - iterative modification of the code, which does not cause functional changes - into the project. The purpose of the refactoring process is to improve the quality attributes of the system, such as maintainability, extensibility, performance, scalability, observability and flexibility.

About the Client

Britenet carried out a process of system re-architecture in **Education First**.

Education First is a global leader in the education industry. A few years ago, one of the Education First departments decided to move their CRM system to the Salesforce platform in order to improve the efficiency and speed of customer service.

Analysis and Objectives

Britenet started working several months after the system went live. Unfortunately, the system already showed signs of erosion at that time. Platform limits were often exceeded. This was caused by the improper technical implementation of features and led to data damage.

Therefore, apart from further development of the system, one of the objectives of the project was to achieve a wide-range scalability, which would allow stable functioning with a simultaneous load of several thousand users and an inflow of several dozen to several hundred thousand records per day. Of course, all this while maintaining continuous, uninterrupted operation of the system and a high degree of extensibility.

Plan

The high requirements forced a wide range of changes in the system architecture. Therefore, Britenet specialists shifted from a highly procedural approach to an object-based one, at the same time trying to accurately define the scope of responsibilities and relations between system modules.

Coding standards, a requirement to write good quality unit tests, the process of static code analysis, and peer review were introduced into the development process.

A plan was prepared to prioritise the tasks that required the lowest amount of work while providing the best results. In each sprint, from 10 to 30% of technical tasks were introduced in such a way that they do not interfere with the implementation of new business requirements.

Effects

System speed and performance

Britenet built a module that facilitated feature optimisation and reduced the number of database operations. The number of cyclic relations in the logic was reduced and most features were transferred from free Process Builders to the code in triggers.

Scalability

Britenet introduced a module that mimics the functioning of Messaging Queues, based on Salesforce Platform Events, which enables queuing tasks and their reprocessing in the event of errors. A generic asynchronous code call mechanism was also used, enabling dynamic selection of an appropriate strategy depending on the call context (e.g. code performed during system user's work is performed synchronously, but the same features for integration processes are performed asynchronously).

Observability

Mechanisms for logging errors and tracking the number and speed of asynchronous calls, the status of system queues, platform limits and the status of main automatic processes in the system were introduced. It is now possible to create reports and dashboards showing what is currently happening in the system from the technical side. E-mail notifications about incorrect system functioning were also implemented.

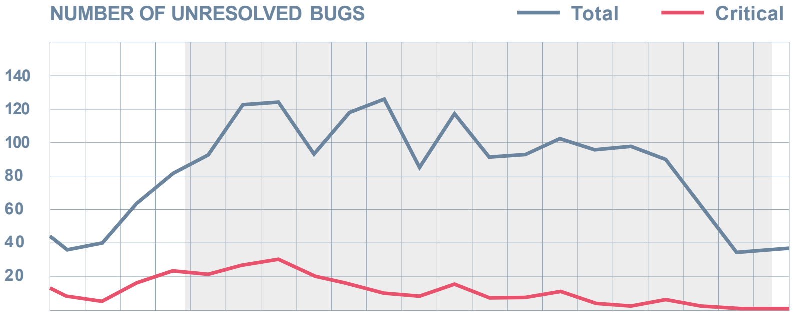
Extensibility and flexibility

During the refactoring process, most of the code was divided into small, simple classes, while taking care to maintain appropriate relationships and scope of responsibility. Many configurations were moved to Custom Settings and Custom Metadata. Using the Feature Toggle design pattern, Britenet made practically any feature possible to be disabled from the administrator level.

Maintainability

In order to be sure that there are no new errors, Britenet increased the number of unit tests (from 200 to 1700). As a result, well-tested and stable tools were developed, on which business logic was based. Code quality was improved by reducing the technical debt indicated by the static code analysis tool (from 22k to 3k). Platform limit consumption was significantly reduced (e.g. daily async apex limit from approx. 800k to 100k, daily api calls limit from approx. 1500k to 600k).

The following diagram shows a report on the number of unresolved errors per month. Blue colour indicates the time from the moment of introduction of the refactoring process to the moment of approx. 80% completion of the re-architecture process.
As can be seen, the refactoring process does not bring immediate results, but, over time, it significantly streamlines system maintenance and development, significantly reduces errors and makes it difficult to introduce them.



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About the author

Adam Siwek

Salesforce Technical Leader, who has been associated with Britenet for over 11 years. During his career he has held various roles in IT projects and worked as a Programmer, Team Leader, Analyst, Architect, Consultant and Manager. He feels great in working on the borderline between IT and business and has worked for clients representing such industries as energy, banking, lotteries, sales, manufacturing, health, administration, logistics, telecommunications and pharmaceuticals.

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