Automated maintenance of a software portfolio

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Software systems need to be updated from time to time. This can be regular maintenance, such as error corrections, as well as more structural modifications like conversions and migrations. The most well-known structural changes are Y2K and Euro, but there are many more of such mass update projects. Hardware and software upgrades, expansion and conversion of data structures, platform and language migrations; these are all examples of changes which are sooner or later applied to any business critical system. No matter the precise change, all these software projects share similar characteristics. The modifications must be made in a systematic way, i.e. in many places throughout a system, or even throughout an entire software portfolio. Such massive changes must be carried out all at once; it is not possible to modify only part of a system and then expect it to work with the rest of the system or portfolio.

A company in the financial services and insurance industry upgraded their database management system to a new version. The database management system was used for keeping the customer records, as well as for the accounting. Over 600 employees within in the company used the system on a daily basis. Access to the database was provided through several Micro Focus Cobol systems on a Windows platform, which were initiated in the 1980s and continually modified and enhanced.

Due to the growth of number of customers as well as other factors the size of the database has increased a great deal since it was initiated. This growth was reflected in the performance of the applications, and therefore the company decided to upgrade their database management system to a new and faster version. This new version was not entirely backward compatible to the old version due to some changes in the language interfaces. Therefore, some of the calls to the database were unsuccessful and had to be altered. The changes to the language interfaces were documented by the vendor of the database management system, so the system experts of the Cobol applications knew, in theory, how to update the calls to the database. However, there were about 48 thousand calls to the database spread over a software portfolio of 45 systems, covering more than 4 million lines of code. The company was not able to carry out such a drastically scattered portfolio-wide change. This is far from the day-to-day routine of normal maintenance, and in fact this type of systematic change is subject to active industrial research in projects and conferences. The company also realised this, and sought our assistance in solving this problem.

We report on an automated mass maintenance project that was carried out by us. We updated an entire software portfolio automatically. The updated portfolio was accepted by the company and taken into production. The complete report can be found at [1].

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References

[1] N. Veerman. Automated maintenance of a software portfolio. Available at http://www.cs.vu.nl/~nveerman/research/auto-maintenance/auto-maintenance.pdf.