

UPGRADING SYSTEM LANDSCAPES

Technical migration - Upgrading existing software

Facts

Many companies today face the problem of software that has been in use for years but has reached the end of its life cycle due to outdated hardware, lack of support for the underlying basic software or lack of flexibility and expansion options.

These systems can be replaced with either standard software or a new customised solution. Where large, complex systems are involved, this decision is not easy given the inherent high costs and risks; in many cases, companies simply put off making a decision, resulting in higher operating costs, not to mention operational risks, particularly if the supplier is no longer able to guarantee support.

One possible alternative to a new standard or customised solution is to undertake a technical migration of the existing systems.

Key aspects of technical migration

Technical migration involves transferring an existing software program, an application or a system to a new platform, whereby functionality, logic and processes of the existing solution are taken over 1:1.

Any modifications to the business logic are carried out in a second step, and the user interface requires only a very minor design modification.

Requirements for a technical migration

Technical migration makes sense if the following facts are given:

- The system has reached the end of its life cycle or needs to be integrated into an overall system. The implementation of interfaces to the old application would be too complicated or too risky.
- The existing system meets the functional requirements.
- There is no standard solution available on the market that meets the functional requirements and fits in technically with the system landscape.
- The system has a certain size and complexity.

- The system code is of a good quality.
- The customer is in a position to set up test cases and is prepared to participate in the tests. The test cases cover more than 90% of the system's functionality.
- The system can be set up in a dedicated environment at the start of the migration and used as an operational reference system (code freeze).
- The system can be frozen so that only the essential modifications need to be made.

Advantages of a technical migration

A technical migration offers many advantages, including the following:

- The functional aspects of the system can be taken over 1:1. This avoids the risk of business processes being implemented incorrectly.
- The existing business logic can be taken over and doesn't need to be redefined with new specifications, which protects investments.
- Less time spent on specifications and rollout minimises the strain on the customer's resources. The migration is carried out without specifications. The old application is used as the reference.

- Especially where a high number of users are involved, the fact that there is no need for special training or increased helpdesk activities following the rollout greatly eases the burden on the company.
- During the technical migration, a refactoring can be performed at the technical level to reduce code duplication and introduce abstraction levels, for example. This greatly enhances the application's maintainability.
- Easy to offshore as the developers do not need any specialist's knowledge for their work.

Example of a successful technical migration: tax applications for the Aargau Cantonal Tax Authority

In 1986 the Aargau Cantonal Tax Authority (KStA) developed customised applications for the collection of cantonal taxes and direct federal taxes (billing of taxes, receivables management and accounting) as well as for the address and tax register. The applications were upgraded on a regular basis. User groups included employees of the Cantonal Tax Authority on the one hand and the tax and financial authorities of around 240 municipalities in Aargau on the other.

The applications had been developed using Cobol and Delta and were run on a Unisys OS 2200 host system.

The users were extremely satisfied with the application's functionality for cantonal tax and direct federal tax collection. The tax and address register, however, needed to be changed. On the operational side, the outdated infrastructure was generating increasing costs and there was an urgent need for an integrated system.

ELCA migration project

ELCA supported the tax authority in all areas, from design and development to integration and production.

In a first step, a proof-of-concept was used to examine the feasibility of migration; this was followed in a second step by the successful

implementation of the project. The initial proof-of-concept enabled a detailed cost estimation for full migration to be carried out and a project plan with clear risk factors to be drawn up.

The chosen approach

Following an in-depth analysis, a mixed (automatic/manual) migration approach was chosen in order to achieve an optimum cost-benefit ratio:

- A new address and tax register was developed, allowing the new requirements to be implemented, above all in the area of people management.
- The collection and billing of cantonal taxes and direct federal taxes was migrated technically.
- During the technical migration, the code was migrated automatically wherever possible. Automatic migration is based on rules and is ideally suited for structured code. The requisite tools were

developed especially for this. Parts that could not be migrated automatically were migrated manually in ELCA's proprietary offshore development centre in Vietnam. This scenario made it possible to remain within budget.

- The system landscape was implemented as a SOA architecture using Microsoft.NET and integrated with further peripheral systems (centralised user administration, output management, archiving, etc.).
- Maintainability of the resulting code within the budget was always a key priority.

Conclusion:

The technical migration approach allows applications to be successfully upgraded. That way, systems with strong functionality can continue to be used on modern platforms in the future. At the same time, life cycles are extended and investments protected. In addition, greater flexibility is achieved in terms of modifications and new requirements while maintainability is enhanced, with corresponding cost benefits.

With this project, ELCA successfully demonstrated once again the feasibility of a technical migration of complex systems. At the same time, ELCA was also able to further expand its capabilities in this area.

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