clearstream | **DEUTSCHE BÖRSE GROUP**

Clearstream builds solutions for XML environments

Clearstream successfully achieved a substantial reduction in the cost of implementing ISO XML for fund messages with the use of processable standards definitions provided by SWIFT. These definitions are now available from SWIFT as part of the Standards Developer Kit (SDK), a downloadable package of processable standards information. Clearstream now aims for even greater savings by exploiting the full potential of the SDK to further automate standards implementation.

Clearstream, the established provider of settlement and custody services, is part of the exchange organisation Deutsche Börse Group. It offers comprehensive services for both domestic and internationally traded bonds, equities and investment funds. Serving 2,500 customers in more than 100 countries, it maintains a leading position in the international fixed income market, with over EUR 10 trillion in assets under custody.

Clearstream's business depends on the exchange of information with customers in complex and diverse markets. Tracking, documenting and implementing the standards that define these information flows is a major challenge. SWIFT's new Standards Developer Kit offers Clearstream, and its customers, enormous potential for savings in standards implementation compared to the traditional approach.

Benefits

- › Substantial long-term cost reduction and sustainable long-term efficiency gains through reduction in project duration and resource effort
- › Flexibility and ability to respond quickly to customers' needs
- › Simplified implementation process via advanced automation tools
- › Optimal support for customers in XML standards implementation

Drivers

Clearstream's business depends on the automated exchange of precise and unambiguous information with its customers. Electronic messages based on global SWIFT and ISO standards go a long way towards making this possible. But global standards alone are not enough. Every market in which Clearstream operates is subject to slightly different regulations, and each has its own local practices that change over time with the emergence of new regulations and business requirements. Clearstream's business processes also continually evolve as a result of an ongoing drive to offer the best possible service to its customers. Adding to this complexity, the underlying standards themselves change on a more or less annual basis. Like other SWIFT players, Clearstream devotes significant resources every year to managing standards changes, modifying its own systems and message implementations, and providing tailored message usage guidance and implementation support for its customers in each market.

Based on Clearstream's experience in Funds, this paper describes the development of Clearstream's approach to this challenge, and the benefits from automation it continues to gain for its customers.

SWIFT

Traditional approach

Until recently, standards projects were largely manual efforts – and relatively labour intensive. Rainer Vogelgesang, Vice President Product Management and Design for Investment Funds at Clearstream, takes up the story:

"Market infrastructures like Clearstream face the ongoing challenge of guaranteeing standards compliance as well as ensuring customers use standards in a way that is compatible with their business processes.

"In the past we used a traditional software development approach. Starting from the annual standards release documents – each running to hundreds of pages – our project would follow a series of well-defined phases: requirements analysis, solution definition, design, build and test, internal and customer readiness. At each stage, specifications, test-cases and internal and external documentation were produced and manually cross-referenced with the requirements identified in the analysis phase. This was particularly labour intensive, because the details of the standards were only available in document form; each section of which needed to be carefully reviewed for changes. For each distinct market we had to produce separate guidelines, ensuring that each complied with both local market practice and the necessary changes identified by our standards analysis."

Towards standards automation

A better solution was needed. ISO 20022's choice of XML as the physical representation (i.e. the syntax) of standardised ISO 20022 messages made a new approach possible, based on machine-readable XML message definitions – in the form of XML schemas. Using a generic XML development tool, Clearstream analysts were able to capture analysis information directly in the schemas. Because the schema format was processable, this information could then be fed straight into many of the downstream processes, including the production of customer documentation. The ability to reuse analysis automatically from one project phase to another, without having to track and cross-reference manually, had a dramatic effect on productivity. Vogelgesang continues: "Using XML schemas to capture and document requirements, specifications and user documentation, and employing where possible a tool-based approach, considerably increased our efficiency – by 30% compared with the traditional approach."

Further progress

This was a significant result, and the Clearstream team were satisfied with the progress they had made. But XML schemas do not define the whole standard, only message structures, and then for only one particular release at a time. What had become clear though was that more automation would be possible – if only more of the standard was available in a processable form.
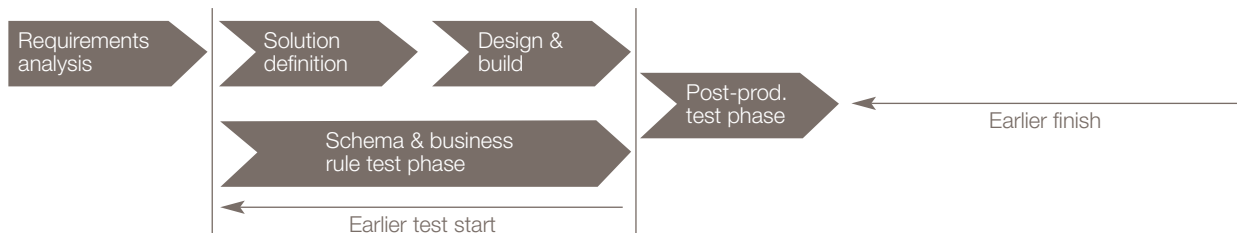
As an early adopter of ISO 20022, Clearstream was in regular contact with the SWIFT Standards Department, keen to share insights and explore ideas for its own benefit and that of the community. A recurring theme throughout these conversations was the need for processable standards information. As developers and submitters of the messages used by Clearstream, SWIFT maintains the electronic source of the standard. Prompted by Clearstream's experience, SWIFT used this source material to develop a prototype standards automation product, the SWIFT Standards MX Repository, aimed at delivering rich standards definitions in a machine-friendly format. This product was later made available to a wider group of SWIFT customers and SWIFT partners in a formal beta programme.

The beta programme was the ideal forum for users of XML messages and tool providers to discuss and exchange their experiences. As the programme went on, the Clearstream analysts decided to further refine their approach by leveraging

Classic implementation approach

| Requirements analysis | Solution definition | Design & build | Schema & business rule test phase | Post-prod. test phase | Finish |

XML implementation approach

Requirements analysis	Solution definition	Design & build		Post-prod. test phase
	Schema & business rule test phase			Earlier finish
	Earlier test start			

Ⓐ **Classic versus XML implementation**
XML brings to bear its full potential by leveraging the automation capabilities inherent in XML tools. The XML approach supports all project phases and is less error-prone. Testing phases can commence as soon as the requirements analysis is completed, giving a shorter overall project duration and shorter time-to-market for enhancements and change requests.

a pre-existing set of specialist XML tools, designed specifically for developing messaging standards.

The combination of the SWIFT-supplied standards automation product and these specialist tools was powerful, dramatically increasing productivity – a reduction of approximately 50% in effort over the traditional approach (see graphic). Vogelgesang adds: "By implementing this refined combination, we are able to capture all the information required to document our market-specific requirements on top of the global standard. From it we can automatically generate complete customer documentation and web-based test facilities that enable our customers to check standards compliance before embarking on costly integration tests."

### New possibilities for collaboration
The adoption of this new approach by the German SWIFT Securities User Group (DESSUG) for specifying the German Market Practice rules is further testimony to its agility. During an afternoon session at one of the regular market practice review meetings, the participants reviewed and defined the German Market Practice specifications of the XML messages currently used in the German domestic investment funds market. Vogelgesang continues: "At the DESSUG meeting, I simply beamed the message templates onto the projector screen and edited them 'live' during the discussion. The demonstration was tremendously successful, as the participants could see

first hand the power of this tool. A similar meeting six months previously, where we used the former spreadsheet-based method, had become unworkable due to the complexity and sheer volume of cross-references through which the message elements of the various message types are correlated. This new method is much more efficient than any previous approach with clear benefits for us, our customers, and other market participants."

The future
Significant advantages have already been gained from repository-based standards. However more automation can still be achieved. Processable standards information can be used to track the ongoing evolution of messages, highlighting those areas that require development attention from one release to the next. With the right tool support, this capability will further reduce the analysis effort required to accommodate standards changes by exploiting the automated reuse of analysis results from previous releases.

Clearstream estimates that an optimal combination of machine-readable standards information and the next generation of standards automation tools will reduce the overall project effort for maintenance releases significantly; a challenge and an opportunity for Clearstream, SWIFT and the tool providers alike.
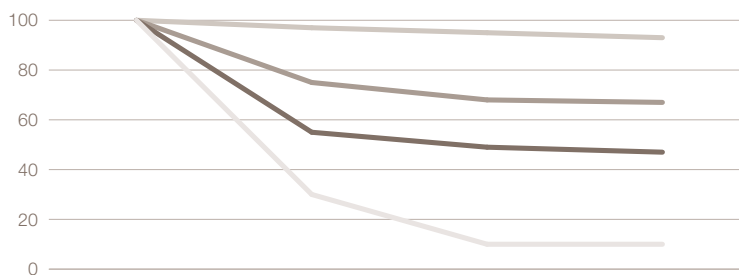
Ⓐ 50% cost reduction using Standards Developer Kit (SDK)

▬▬ Classic approach: continuously high effort due to lack of automation capabilities

▬▬ XML schema and generic tools: 30% savings due to automation capabilities within one release, no support across maintenance releases

▬▬ Current; SDK and specialised tools: 50% savings through SDK access to standards specifications and optimised tools

▬▬ Future; optimal situation: 90% savings through leveraging previous maintenance release specifications accessible in the SDK

Solution overview – the Standards Developer Kit

The machine readable standards information used by Clearstream will be available to SWIFT customers and partners during 2009, following the completion of a pilot programme currently targeted for the third quarter of 2009. It is one component of SWIFT's Standards Developer Kit, a coherent set of resources aimed at supporting all phases of standards implementation, from analysis, through to design, build, document and test.

The Standards Developer Kit includes a machine-readable repository of message meta-data, which can be consumed in a variety of forms. Clearstream uses this data, in the form of enriched XML schemas, to produce customised processable documentation for its own and its customers' use, and a custom message validation service that allows customers to test their implementations early in the development process.

Conclusion

Clearstream is pioneering the automation of standards and has already derived significant business value from its investment. Through its optimised implementation approach, Clearstream demonstrates its thought-leadership and empowers its customers to tap into the benefits of XML messaging.

With SWIFT expanding the roll out of XML message standards into other business areas (securities clearing and settlement, cash processing, custody, proxy voting, etc.), the value proposition of the standards automation will be multiplied, ready to unleash its full potential for sustained, long-term efficiency gains. SWIFT is committed to offering similar opportunities to the whole SWIFT community, through its Standards Developer Kit.

About SWIFT

SWIFT is a member-owned cooperative that provides the communications platform, products and services to connect over 8,300 banking organisations, securities institutions and corporate customers in more than 208 countries. SWIFT enables its users to exchange automated, standardised financial information securely and reliably, thereby lowering costs, reducing operational risk and eliminating operational inefficiencies. SWIFT also brings the financial community together to work collaboratively to shape market practice, define standards, and debate issues of mutual interest.

For more information, please contact your SWIFT account manager or visit www.swift.com.

For more information about Clearstream's XML implementation, please contact productmanagement@clearstream.com.