



atoll technologies

Treasury Backbone

An Intelligent Financial Exchange, Interest Rate and Securities Management System

**Enterprise agility starts with
a strong backbone. Get in shape!**

Introduction

Atoll has been working actively in banking business environments for the past decade, delivering expertise in the form of business & IT consultancy and technology solutions.

Spending time with critical banking systems, we have found that Treasury applications are missing proper integration on the static metadata and the ever changing market data levels. In most cases, managing financial exchanges, interest rates and securities and distributing them to back-end systems are done in two ways:

- building custom point-to-point system connections every time a new system is introduced,
- or simply by "human interfaces", meaning that Treasury staff need to either type the new or changing market information from one system to another, or perform manual file conversions and load them to target applications.

Many calculations, fixes, validations and approvals are done by hand in Excel sheets and emails or sometimes even on paper. Often, the same actions and calculations are performed repeatedly with slight changes in different systems. You don't have to look far to find the same market data referenced differently in various applications.

All of these increase the chance of failure to a great extent and the risk of publishing false market information, thus giving you an unwanted opportunity to lose money and reputation.

Applying SOA practices

Having the Treasury systems among the highest priority applications of your Bank, applying the SOA approach here can add considerable value:

- By building one "internal data market" you'll be able to manage all your data sources and target systems centrally. You can offer accurate, validated and approved market information as a service to back-end systems. You can benefit of this on many ways:
 - our experience shows that almost every bank purchases highly overlapping data streams from distinct service providers. Contracts with external MDS providers can be rationalized.
 - you can create, maintain and govern a strategy for market data flows. New receiver systems must subscribe to your "internal data market", giving you great flexibility to grow and a good overview to govern effectively.
 - with a centralized system, you can achieve greater flexibility in terms of introducing new FX, securities, even new data sources as well as receivers. Withdrawing them is also easy. These operations require significantly less effort, time and money.
- By utilizing a central communication backbone, you can ensure that sensitive market data is provided on a secure channel to back-end applications. This will deliver you:
 - a consistent, protected way of market information distribution across your entire organization
 - an auditable distribution process
- As the result of the two benefits above, you will access a full audit trail of market information processing; including source information history, cross-rate and other calculations, validation checks, pricing approvals and data deliveries to banking applications. It makes you able to:
 - conduct analyses of your real market data usage
 - verify if you're paying for the right data sources
 - prove which market data was sent to which system at any point of time

Treasury Backbone focuses on the core of Treasury operations through the following three modules:

- Financial exchange rate management
- Interest rate management
- Securities management

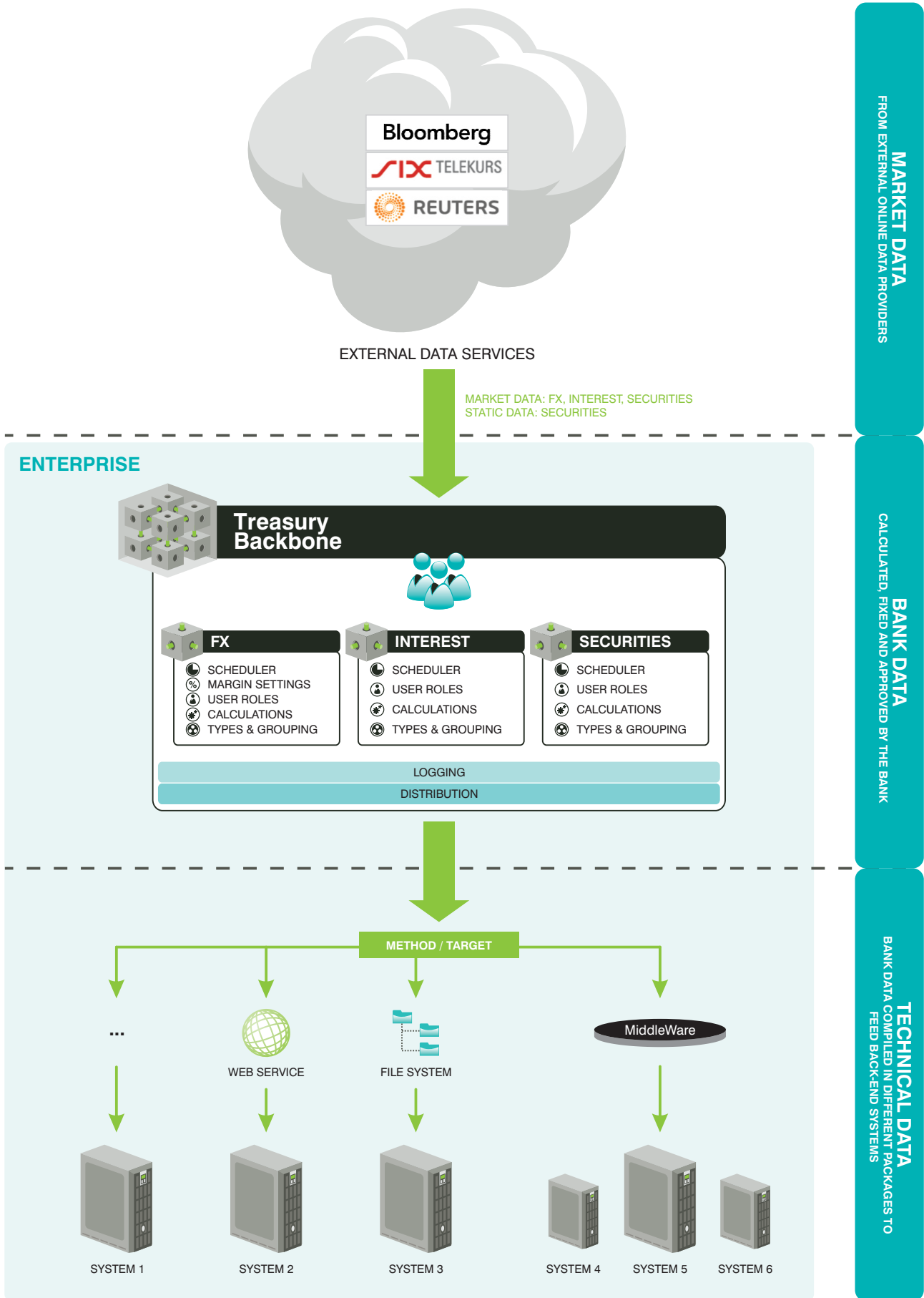


Figure 1: High-level architectural view of an Enterprise using a centralized Treasury Backbone: Bank Data is created from External Market Data by customized fixing, validation and approval processes. Once generated and approved, Technical Data is compiled, which is distributed in the correct format to subscribing back-end systems.

The principles are the same for all three modules:

1. Use a central application to satisfy the hunger of back-end systems for market data
2. Connect directly to external and internal market information sources on multiple interfaces like Web Services, APIs, Message Queues, Files, and more
3. Perform calculations, fixing, validations on raw data
4. Ensure approvals
5. Distribute market data to subscribed back-end systems

Market Data management process

Overview

The aim of Treasury Backbone is to ensure that market data is sourced, stored, calculated and distributed in a consistent and auditable way. The principles – described above – govern the fulfillment of these aims. They are applied by each module of Treasury Backbone (FX, Interest Rate and Securities) in the following manner:

1. Starting the process may be triggered by regular schedules, or by a user, or an event captured
2. The Backbone keeps a repository of the following, enabling management by business users:
 - a.) FX, interest and security types
The types of FX, interest and security to handle
 - b.) Fixing types
The periods of fixing – morning, daily, afternoon, etc.
 - c.) Margins
The calculation rules for margins
 - d.) External Data ID
Unique references to objects of external market data providers, like Reuters Instrument Code, Bloomberg Instrument Code, and so on.
3. FX, interests and securities are collected from
 - a.) external online data market services, like Reuters, Bloomberg, Telekurs
 - b.) internal data sources, like manual inputs, file uploads, databases
4. Fixing is performed according to the defined policy. It can however be overridden by a business user (see Figure 3).
5. Validation is performed to ensure data consistency, threshold compliance and back-end system compatibility.
6. The four-eye principle ensures that no price is distributed without approval. Once confirmed, external market data becomes internal bank data.
7. If needed, transformation to back-end system format is conducted. This is when bank data is turned into technical data, which is then distributed to back-end systems.
8. Distribution is logged and further automatic or manual actions can be conducted.

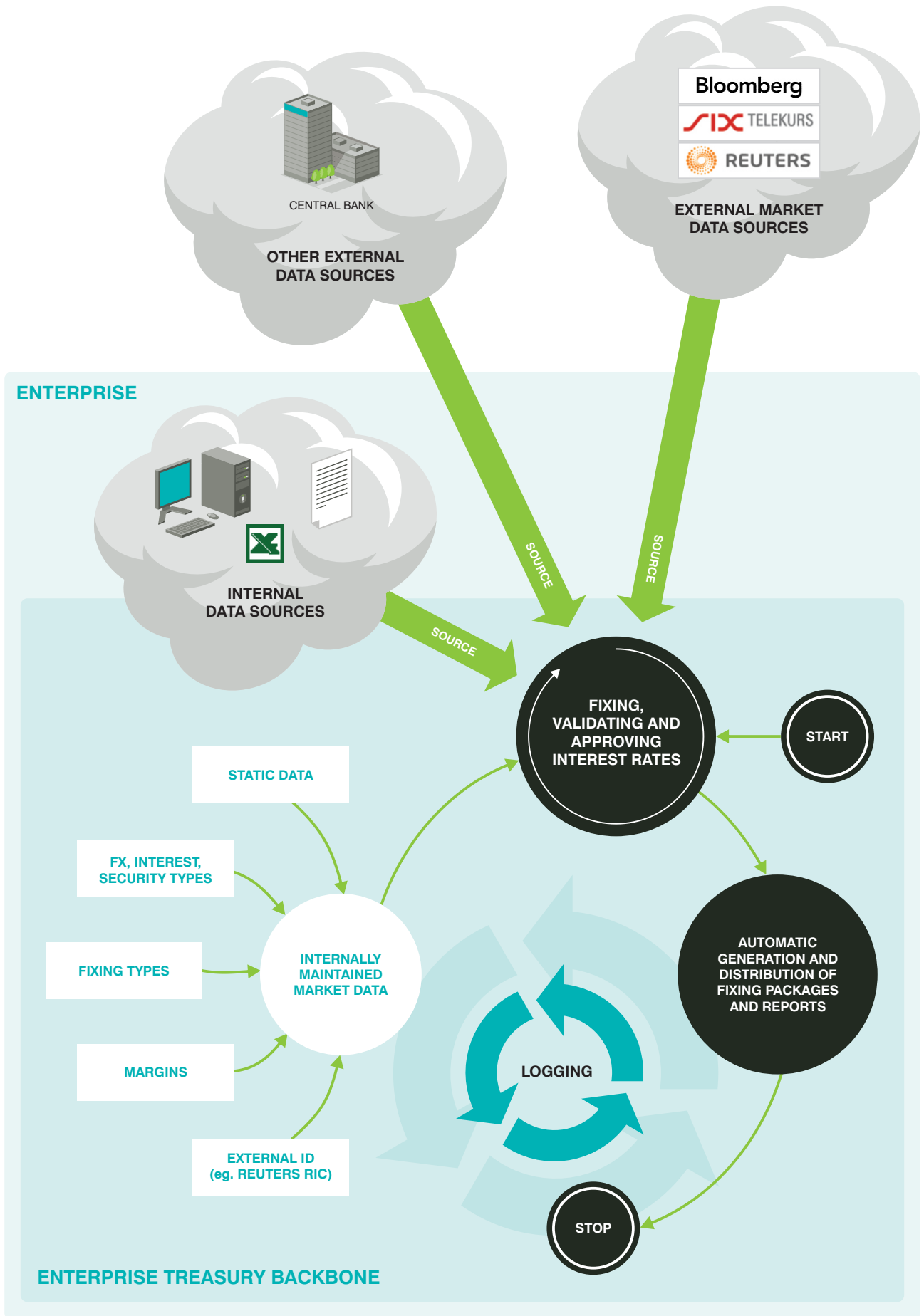


Figure 2: Data Flows

Connecting to online data markets like Reuters MDS

Online market data services can be directly connected for on-the-spot FX, interest and securities information. Treasury Backbone is capable of interfacing with the APIs of these services, enabling you to utilize the information provided with no additional human intervention. There's no need to employ data terminals (for example Reuters Data Terminal) and perform data export and import operations. Once connected to the Reuters service, the administration interface of Treasury Backbone allows users with appropriate privileges to manage subscribed market data – any Reuters provided information can be added or removed from the data fetch, then converted, fixed and pushed forward to back-end systems.

Please note that you need to have a valid subscription to online market data services of your selected provider to access online market information.

Fixing, validating and approving rates

Based on different roles, the application offers distinct functions to users. By default, the following user roles are defined in the system: Dealers, MidOffice users and Administrators.

Once the online FX information (morning, foreign trade, Central Bank official, weekend, etc.) is received, the official cross-rates can be quoted automatically as per the defined rule-set. On the base of the interest rate data fetches and the pricing rules, bank interest rates can also be generated.

Dealing room employees are able to fine-tune these rates and, once validated, forward them for approval. The application warns users if the new pricing values differ from the fixed rates of the last business day in excess of the configured threshold.

SYS ID	Rate type	ISIN	Data source	Source ID	Quoting unit	Value date	Rate
604	Daily Minimum	HU0000061726	BLOOMBERG	=BLMBOTPHUF	1	01.01.2010	4500
626	Closed Price	HU0000704697	MANIJAL	Manual input	1	01.01.2010	
603	Closed Price	HU0000068952	REUTERS	MOLHUF=	1	<< < January, 2010 >> x	240.3
603	Closed Price	HU0000068952	REUTERS	MOLUSD=	1	MO TU WE TH FR SA SU 1 28 29 30 31 1 2 3	564
624	Closed Price	HU0000068950	REUTERS	SYNUSDNYRIC=	1	2 4 5 6 7 8 9 10	781
624	Closed Price	HU0000068950	REUTERS	SYNHUFBDRIC=	1	3 11 12 13 14 15 16 17	1240
623	Closed Price	HU0000074067	REUTERS	DANRICHUF=	1	4 18 19 20 21 22 23 24	780
623	Closed Price	HU0000074067	BLOOMBERG	=BLDANEURO	1	5 25 26 27 28 29 30 31	88.76
690	Closed Price	HU0000174079	REUTERS	DANRICEURO=	3	6 1 2 3 4 5 6 7	123.2
690	Closed Price	HU0000174079	REUTERS	=BLDANEURO	1	01.01.2010 Clean Today	945

Figure 3: Fixing rates: Dealing room employee checks the security rates received from different external sources. Pricing can be accepted or overridden; manual rates can be set individually. Once done, fixing can proceed.

Rates must be approved or rejected by a decision maker. When approved, the new pricing (bank data) becomes fixed and prepared for distribution.



Figure 4: Personal Workbench: The approver can accept or decline any changes to static or market data

Distributing rates to various business areas

The system automatically sends the compiled and approved figures to the pre-defined target systems, for each in the appropriate electronic format (where “format” means both syntax and technology). Bank data transformed into deliverable packages is called technical data. The back-end (or receiving) system subscriptions for the data distribution are also stored in the database, allowing new systems to be added through registration. This way, every system that depends on FX, interest or security rate distribution can receive data directly.

Most of the common interfaces such as Message Queues (IBM WebSphere MQ, JMS, etc.), flat files and Web Services are ready to be used. Any other custom communication method can be also adapted by the distribution engine.

All distribution activities are logged and can be traced back any time.

Summary of functions

Business Functions

Data Input

- Reading online data from Market Data Services;
- Recording and management of all data received;

Processing

- Automatic calculation of bank data like cross exchange rates, averages, interests, securities;
- Validation and warning functions when rate differences are detected. These functions are controlled by pre-configured rules; notification is sent to designated employees;
- Creating special rates and pricing;
- Multi-level approval process (four-eye principle);
- Built-in workflow to support the fixing procedure, aided by web interfaces, notifications and warnings;

Distribution

- Compilation of bank data into technical data ready to be distributed;
- Automatic distribution after approval;
- Reporting on distributed rates;

Management

- Maintaining distribution lists from the user interface;
- Managing different types of FX, interest and security. Parameters can be configured from the user interface;
- Managing FX types, fixing types and fixing groups. Parameters can be configured from the user interface;
- Configuration of parameters dependent on the type of market data (e.g.: decimal values);
- Handling bank holidays;
- Handling margin data (margin expressed as a percentage). Parameters can be configured from the user interface for each FX type;
- Full audit-trail;
- Reporting on historical data received, generated and distributed.

Technical functions

- Permission management;
- User identification and authorization through LDAP servers;
- Re-sending fixed FX rate packages from the user interface on demand;
- Detailed logging of all actions performed in the system.

Related areas

We believe in the principle of *“Think Globally, Act Locally”*. Treasury Backbone focuses on improving the daily operations of the Treasury Department within your Enterprise; as such, it is a central and important part of your overall Enterprise Strategy. The improved efficiency of your core infrastructure will have measurable effects on other areas of your organization. When implementing Treasury Backbone, we must ensure that it complies with the overall architectural picture of your organization.

Atoll Technologies can help you in the following related fields:

- **Enterprise Architecture Management (EAM)**

Many companies are suffering from the absence of a central governing body that would create, communicate and control enterprise-wide policies. These policies are the representation of the Enterprise Strategy, which should be kept and acknowledged by all projects, business areas, back-office operations and supporting fields.

SAMU (System Architecture Management Utility) is the Enterprise Architecture Management tool that can deliver you a unified view of your overall structure. You can grasp different layers of your company such as hardware, application, information and business processes, and discover their relationships. The same repository helps IT Managers to see how the IT infrastructure relates to business applications; Business Managers to see how business processes are mapped to business functions; and Project Managers to determine the right scoping of individual projects.

Applying SAMU with Treasury Backbone will let you visualize all your information sources and target applications, linked to business processes. It will provide you with a graphical map of your Treasury information flows applied in the Treasury Backbone.

Having an always up-to-date Enterprise Architecture Map can be extremely valuable for supporting both strategic and operational decisions.

- **Service Oriented Architecture (SOA)**

Treasury Backbone has been developed following the SOA approach, thus it can be easily connected to your Enterprise Service Bus. As such, Treasury is ready to provide internal market data services to the rest of the organization, including different back-end systems. Having the methods to receive, calculate and communicate market information standardized within your enterprise will give you a great degree of flexibility and visibility.

Atoll Technologies has a wealth of expertise in Business and Application Integration in different areas of the enterprise. One of the most sophisticated IBM Message Broker solutions in Central and Eastern Europe has been implemented by Atoll Technologies.

Get. Control. Distribute.

Atoll Technologies Ltd.

Address Capital Square Irodaház,
Váci út 76., 1133 Budapest, Hungary
Phone +36 1 688 6688
E-mail info@atollgroup.eu
Web www.atollgroup.eu

Please do not hesitate to contact us.



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