ALTOVA®

WhitePaper

Data Challenges and the Altova MapForce Platform for Data Integration

An Altova Whitepaper

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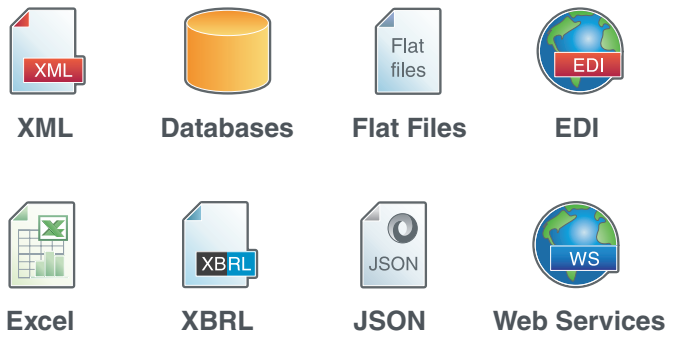
Executive Summary

The ability to collect, refine, and assimilate data that arrives in a variety of formats, from a diversity of sources, and to be amenable to new data formats and resources is critical to success in the 24/7 connected world.

This whitepaper begins with a survey of current industry issues concerning the explosion of data, data integration needs, and problems faced by data architects, data analysts, and other IT professionals and decision-making executives today. Next, an example project profiles a typical data integration challenge to retrieve, combine, and transform data from multiple sources in dissimilar formats. The solution is implemented using the Altova MapForce Platform for data integration. The MapForce Platform automates data transformation, data conversion and integration, report and document generation, and other tasks on dedicated servers, virtual machines, or workstations scaled for the scope of the project.

Furthermore, the MapForce Platform is available at a fraction of the cost of big-iron data management products, and is unencumbered by baggage like outdated design features inherent in many legacy products offered today. The Altova MapForce Platform is a data-centric integration solution ideal for fast-moving workgroups and enterprises of many sizes and a range of budgets.



The MapForce Platform supports data conversion to and from all these data formats

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Introduction

The data engulfing enterprises today comes from many seemingly unrelated sources. **Legacy data** from a variety of maturing relational database systems provides a touchstone reference for historical experience of the enterprise. **Human-created** data is ever increasing, including everything from sales orders entered into existing transaction-processing systems, to a newly-computerized medical record captured on a tablet device in a doctor's examining room, or even an email address submitted by the reader of a Web page subscribing to the publisher's newsletter. **Sensor data** explodes exponentially, recorded continuously in real time by devices from GPS systems, to navigation buoys, to manufacturing-based sensors including RFID and bar code readers, even wrist-worn devices that measure the physical activity of athletes and mere mortals. And, of course, the so-called "internet of things" is surging online with appliances like thermostats, switches, and motion detectors in security systems. **Publicly-available reference data** is a rich source of external information, as governments, trade organizations, and research institutions make available libraries including census data, agricultural records, and corporate financial reports in XBRL format, academic research findings, and more. Some reference data is available as a downloadable document or dataset, while dynamic information like currency exchange rates can be looked up in real time via a Web service request.

Corporate **mergers and acquisitions** frequently lead to large data integration and consolidation projects. Internal databases storing information about everyone from customers to employees to suppliers, and descriptions of manufacturing bills of materials, current inventories, and financial accounting data need to be combined with minimal disruption of ongoing business. Even ordinary **data consolidation, migration,** and **modernization** occur continuously, driven by cloud computing trends, corporate mergers, and pure cost reduction opportunities, and each of these can require integration of data sets from varying formats, for instance migrating from one accounting system to another, or installing a new customer relationship management (CRM) system.

IT professionals, business analysts, data scientists, developers, and executives tasked with any of these scenarios need powerful, reliable, and cost-effective tools to master tidal waves of data.

Well-established vendors in the data-integration environment sell large, expensive systems that often serve as middleware connections to bridge

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different applications deployed in an enterprise. As these products matured, they came to be considered the big iron of data integration tasks. Unfortunately, maturity can have disadvantages. As complexity grows and prices increase, a new installation of a traditional data integration product can be difficult and time-consuming to implement. Some vendors become complacent, even as their cumbersome and unfriendly user interfaces become more cluttered with each product update.

The Altova MapForce Platform for Enterprise Workflow Automation is an extension of a highly successful desktop data integration tool developed for any combination of XML, databases, flat file, EDI, Excel, XBRL, and/or Web service data. The MapForce platform automates data integration and transformation, and other tasks on dedicated servers, virtual machines, or workstations scaled for the scope of the project. The MapForce Platform can be installed quickly, at much lower cost and lower risk than “big iron” data integration solutions, is highly customizable for a variety of current requirements, and adapts easily as needs evolve.

Altova is an independent software developer with over 4.6 million users, including 91% of Fortune 500 organizations, as of early 2014. Altova sells no hardware products or relational database systems, and offers server software that provides the same functionality in Windows, UNIX, or Mac OS operating systems. Therefore, Altova has no inherent interest in favoring any particular hardware, operating system, or database platform in the design and development of the MapForce Platform for Enterprise Workflow Automation.

An Example of Real-World Data Integration

Let’s take a look at an example of a data integration challenge and how it can be solved.

A Company sells a variety of products across many countries whose currency is either US dollars or Euros. As product orders arrive they are entered into an orders table in the company’s centralized relational database. As each month progresses, sales managers of four sales regions want up-to-the-minute reports on sales in the region and the ranking of sales rep performance. For one last complication, official product prices are set in US dollars, but regions cross international boundaries and are rated by total sales in Dollars and Euros, so managers need to see amounts in both currencies and the conversion rate applied.

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It takes just four simple steps to create and deploy this report using the MapForce Platform for Enterprise Workflow management:

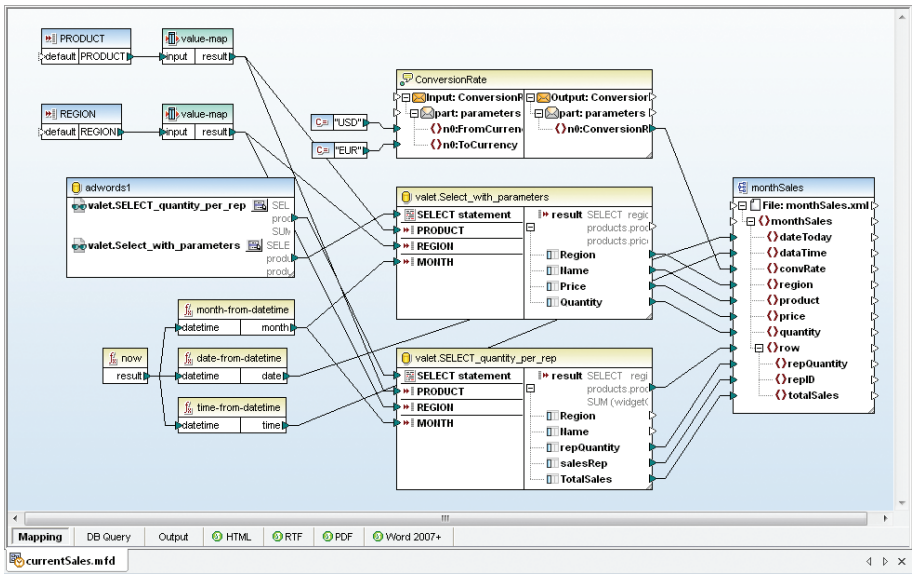
1. Design a data mapping to collect the information required
2. Design a report format to present the information as a Web page
3. Upload the data mapping and report format to FlowForce Server, which manages events, triggers, and the automation of workflows and processes
4. Create a FlowForce Server job that triggers execution of the data mapping and report creation on demand as an http service

Data Mapping Component

Altova MapForce is the any-to-any graphical data mapping, conversion, and integration tool that maps data between any combination of XML, database, flat file, EDI, Excel, XBRL, and/or Web service. Data mappings can have multiple inputs and multiple outputs and combine completely disparate data types. MapForce includes a rich library of data processing functions to perform virtually any necessary data conversion required by the integration project, including string functions, math functions, logical functions, date-time functions, filepath, sequence, and node functions, and much more. Value maps, filters, if-then-else structures, and data sorting features empower mapping designers to solve complex data integration challenges.

The MapForce intuitive graphical interface is designed for use by non-developers and developers alike, and the integrated execution engine provides a testing environment so the data mapping designer can verify results before deploying a mapping to the sever.

Here is the mapping for our project:



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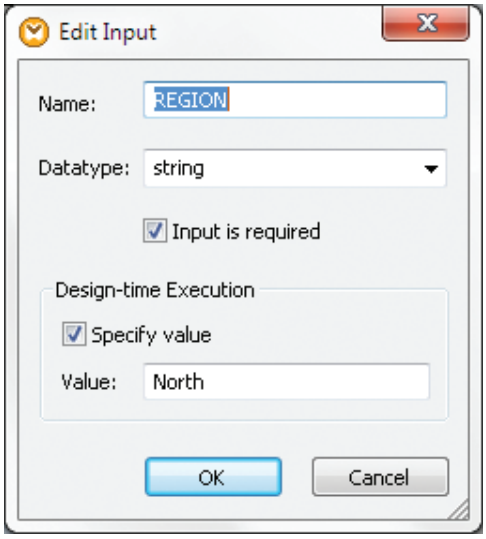
At the top left, the mapping defines input parameters for the product and region to be reported. These parameters flow into two database queries, and ultimately to the mapping output on the right side of the design, as defined by the connecting lines. The parameter values for region and product will be supplied by the user when the data mapping executes, but for design and testing purposes, default values are defined in each parameter properties window.



The data mapping designer can easily change the value and execute the mapping inside MapForce to test all possibilities, even an invalid entry.

The output file for this mapping is an XML document, but it's important to understand the output could also be any of: XML, another database, a flat file, an EDI document, an Excel spreadsheet, or an XBRL file, based on the data integration requirement.

At the top center, the data mapping also includes a Web service request to the currency converter at webserviceX.net, to retrieve the current conversion rate from dollars to euros at the time the mapping executes. The conversion rate is also sent to the output file.

Let's take a look at the relational database for product orders that is queried by the mapping. The widget company orders table contains raw data that does not alone fulfill all the requirements of our project.

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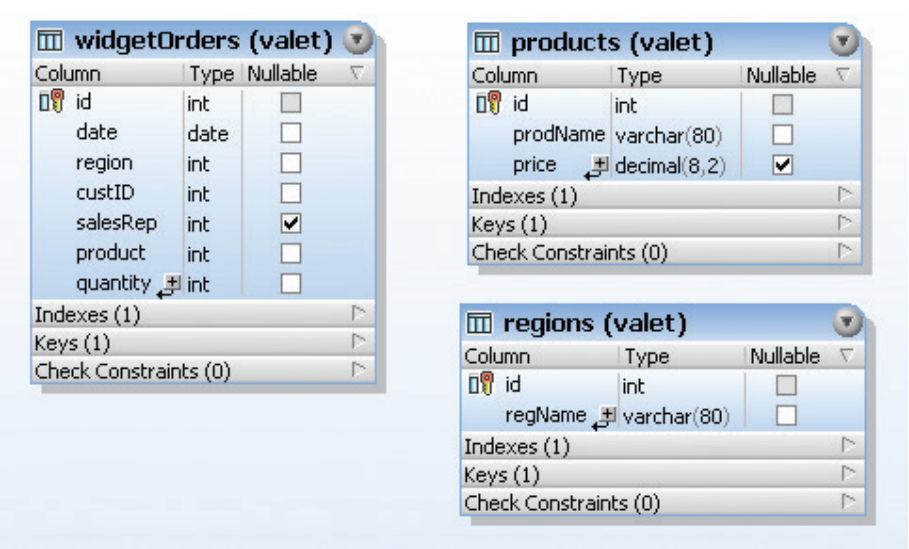
	id	date	region	custID	salesRep	product	quantity
3926	3926	2014-11-07	1	221	1001	5	28
3927	3927	2014-11-08	1	201	1023	4	26
3928	3928	2014-11-08	4	284	4022	1	52
3929	3929	2014-11-08	4	33	4023	2	72
3930	3930	2014-11-08	1	136	1013	1	24
3931	3931	2014-11-08	2	459	2006	1	67
3932	3932	2014-11-08	1	575	1014	3	37

The mapping will have to combine information from related tables to correlate the region number based on its name, and the product number based on its name:



That's not a problem, because any valid SQL database query, table, view, or procedure can be included in the mapping.

In this particular example, the tables are in a Microsoft SQL Server 2008 database. The MapForce Platform for Enterprise Data Integration supports all popular relational databases:

- Microsoft® SQL Server®
- PostgreSQL
- Oracle®
- MySQL®
- IBM DB2®
- IBM DB2 for iSeries®
- Informix®
- Sybase®
- Microsoft Access

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Most large enterprises today use several types of relational databases. A MapForce mapping can even connect to multiple different database types simultaneously to combine information, if the data mapping project requires it. This is built-in functionality that does not require users to purchase any extra-cost adaptors to support specific database vendors, protocols, or message formats.

Data Reporting Component

The information contained in the data mapping result needs to be formatted in an HTML stream to be delivered to a Web browser window. Altova StyleVision is an award-winning tool for designing compelling reports and forms based on XML, SQL database, and XBRL inputs.

Since the data mapping output file supplied all the required information, definition of the report format in StyleVision is straightforward. Here is an example of the report:

Sales Report Month-to-Date thingamajigs for West Region

As of: 04 / 11 / 2014

Region month-to-date total sales of thingamajigs:	**799**
Unit price for thingamajigs:	$1,954.79
Region thingamajigs revenue (US$):	**$1,561,877.21**
Equivalent in euros:	€1,123,926.84
Today's exchange rate US dollars to euros:	$1 = €0.7196

Sales Standings:

Quantity	Revenue ($)	Sales Rep ID
161	153,721.19	4002
123	117,439.17	4011
86	82,111.94	4006
85	81,157.15	4013
76	72,564.04	4021
50	47,739.50	4015
41	39,146.39	4003
38	36,282.02	4018
30	28,643.70	4014
29	27,688.91	4022
21	20,050.59	4017
19	18,141.01	4020
17	16,231.43	4008
15	14,321.85	4004
6	5,728.74	4005
2	1,909.58	4012

From one single stylesheet design, StyleVision can generate documents in html, pdf, RTF, or Microsoft Word, (Open XML) formats. More than a simple report formatting tool, StyleVision is an XSLT stylesheet designer, where a single stylesheet is reused with multiple sources to create consistent, eye-catching results. Reports created via StyleVision stylesheets can contain rich content including, rules, images, dynamic charts based on input data, conditional output, dynamic tables, and more.

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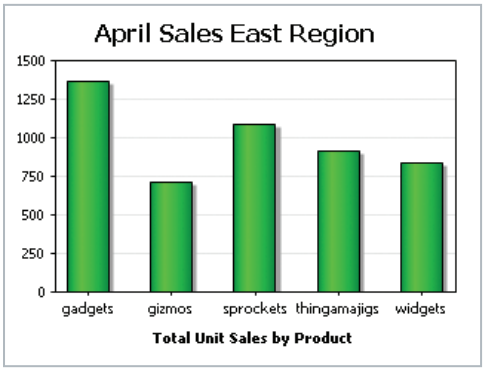
Page-based documents in PDF or word processing formats can include page headers and footers, page numbers, an automatically-generated table of contents, and more.

Our example required only one input source for the report, but like MapForce, StyleVision can combine information from multiple sources in any of XML, SQL database, or XBRL formats. StyleVision can connect directly to all the relational databases listed above, even multiple databases simultaneously, if required by a data reporting assignment.

StyleVision includes extensive charting and graphing features to visualize XML, database, and/or XBRL data in a variety of charts and graphs including:

- Pie charts (2D & 3D)
- Bar charts (2D & 3D)
- Stacked bar charts (2D & 3D)
- Area charts
- Stacked area charts (with transparency)
- Category and value line graphs
- Candlestick charts
- Gauge charts



Numerous customization options are available for each chart type, including chart titles, foreground and background colors, definition of axis ranges and labels, control of fonts, text color and size, and more. Intuitive dialogs let you specify every element of a chart, even the tilt angle for 3D pie charts. Users can also save customized chart settings in files and reload them to standardize designs across multiple reports.

StyleVision also includes auto-calculation capabilities to insert results of calculations based on dynamic data values, information derived from the structure of the document (such as the current section number), data from external XML documents, and many other operations.

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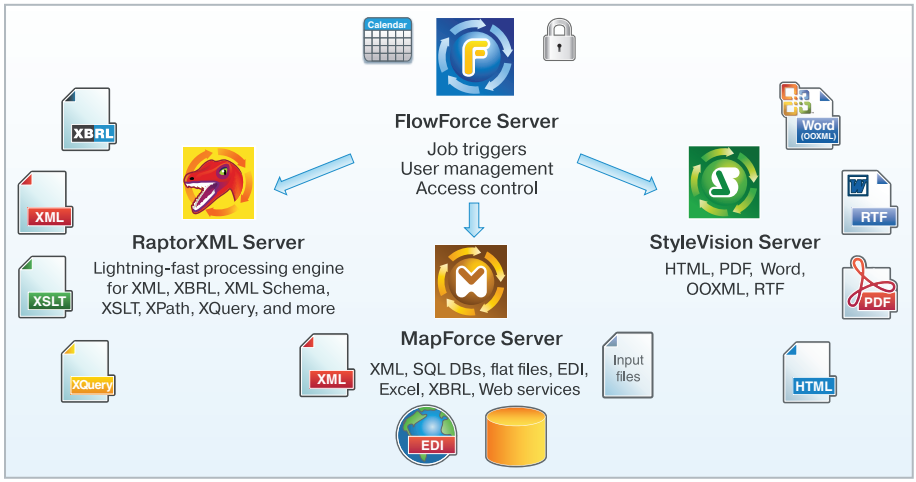
Workflow Automation Component

The data mapping and reporting steps described above were both accomplished using tools contained in the Altova MissionKit, the award-winning suite of industrial-strength XML, SQL, and UML tools for information architects and application developers.

FlowForce Server automates execution of data mappings and transformation, report and document generation, and other tasks on dedicated servers, virtual machines, or workstations scaled for the scope of the project. Jobs are triggered by date and time, detection of new input data, or by HTTP command.

FlowForce Server is a server software application available for Windows, Linux, or Mac OS operating systems.

A flexible and highly customizable system of job triggers lets administrators schedule FlowForce Server processing based on each job's unique requirements. Time triggers start one-time or repetitive job execution, file system triggers start jobs when a change is detected in a file or folder, or HTTP triggers to poll a URI for changes. Multiple triggers may be defined per job and several triggers can be active simultaneously. Whenever any trigger is fired, all execution steps of the job are processed.



Specific features supported by FlowForce Server include:

- Automates RaptorXML / RaptorXML+XBRL for XML, XSLT, and XBRL processing
- Automates execution of MapForce Server to perform data transformations
- Automates execution of StyleVision Server to render reports, documents, and e-forms
- Schedules, triggers, and automates any job on the server
- Activates job execution by time, file, or remote triggers

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- Supports flow control with loops, conditions, result evaluation, and error handling
- Access control via roles, permissions, and privileges
- Configurable email notification for job steps or errors
- Detailed execution logging
- Intuitive Web interface to manage all server activities
- File system access and FTP read and write support

With all this functionality, it's straightforward to define a FlowForce Server job that executes the data mapping and delivers the results for report generation.

To meet the requirements of our original task, we will make the job available as an http service with a URL that might look like: **http://flowforce:4646/service/salesquery?region=East&product=widgets.** The user supplies the parameters for region and product and FlowForce Server returns a report to the browser window, similar to the one shown above.

A robust system of permissions and access controls prevents unauthorized users from running the query.

FlowForce Server uses a web-based user interface, so an administrator can set up FlowForce Server jobs, monitor server activity, and perform other management tasks remotely. The administrator defines job parameters and execution steps by filling in values in a job creation form. No special programming code is required. The job workflow consists of two steps:

- Execute the data mapping for the database query and Web Service exchange rate lookup. FlowForce Server invokes MapForce Server to perform this step
- Format the data mapping results as an attractive .HTML report according to the design created in StyleVision. FlowForce Server invokes StyleVision Server to perform this step

In addition to MapForce Server and StyleVision Server, other job execution steps could perform XML and XBRL validation via RaptorXML, filesystem operations including running batch files or arbitrary command lines, error-handling steps including notification email messages, and even sub-jobs. Sub-jobs are an efficient way to perform repetitive housekeeping activities such as cleaning up working directories, or to break up long, complex data integration requirements into more convenient and potentially reusable parts.

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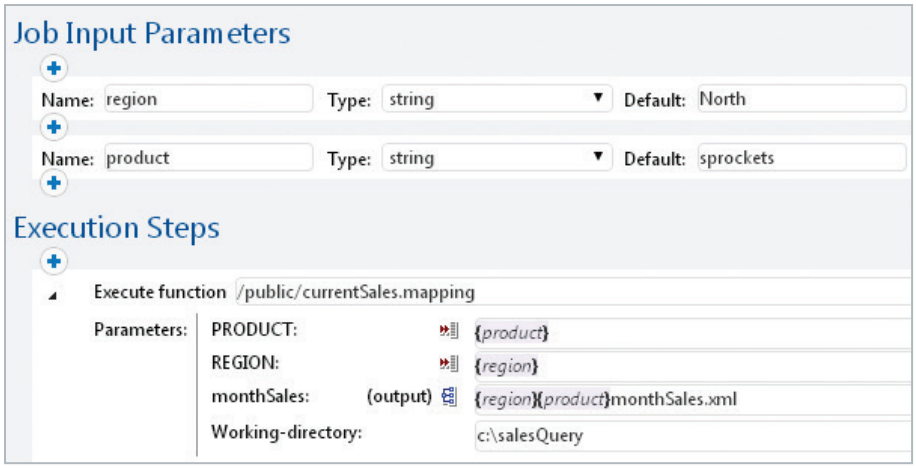
Flow control steps in the job can define branches, loops, an alternate execution path in case of error, and more. Again, no code writing is required.

Here is a portion of the job definition form for our example, showing job parameters and the first execution step:



After the definition of execution steps, a FlowForce Server job provides options to activate result caching, to define time triggers, filesystem triggers, or .http triggers, and an option to make the job available via HTTP at a user-defined URL.

All these various job-triggering settings provide flexibility to support a wide variety of data integration and workflow requirements in a robust environment where multiple jobs can coexist and execute simultaneously to take advantage of modern multi-core CPUs and multi-threaded operating systems.

Each FlowForce Server job definition also includes a credential section that defines the authorization security setting for controlling access to system resources such as directories and other FlowForce jobs. This system of permission and user roles lets administrators control access so multiple users can peacefully coexist on a single FlowForce Server platform without access to each other's data.

To conclude the description of the sales report data integration example, our FlowForce Server job uses result caching to instantly supply data to delight remote users who call the job from their Web browsers. FlowForce server supports automatic cache refresh operations on any timed schedule, so we specified 90 minutes to balance system workload and the need for timely data.

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FlowForce Server automatically updates the cache for each parameter combination, so for our data integration project with four sales regions and five products, a total of 20 combinations of region and product parameters are available, and 20 individual caches are stored and updated. The FlowForce Server Log records detailed information about each job. Note the start and end times for execution of a cached version of our example sales report, based on a user request from a Web browser:

Date	Severity	Module	User	Instance	Message
2014-05-23 11:49:00	INFO	flowforce	guest	13254	Finished job execution: /public/SalesQuery.job.cached
2014-05-23 11:49:00	INFO	flowforce	guest	13254	Starting job execution: /public/SalesQuery.job.cached

Adapting to Change

As our example company's success in the EU market grows, they purchase a former competitor, whose functions need to be imported while the new acquisition is configured as a new sales region.

Only a few small revisions need to be made to the data integration workflow described above:

- The region number and name are added to the regions table in the internal database

	id	regName
1	1	North
2	2	East
3	3	South
4	4	West
5	5	EU

- The number of cached entries in the FlowForce Server job is increased from 20 to 25 to accommodate sales reports for each product in the new region

Caching Result

☑ Cache the result *Cache is used whenever this job is called from another job.*

- *Add a time trigger to create and refresh the cached result or check "Initiated by consum*
- *Create a job that will call this one and will benefit from the cache.*
- *If "Initiated by consumer" option is chosen then add Refresh or Purge Cache timers to pr become too old.*
- *In case of job input parameters present set "Initiated by consumer" option and set "Max entries" to expected number of possible variations of input parameters.*

☑ Initiated by consumer

Maximum number of cache entries: 25

Cache consumer job /public/SalesQuery.job.cached is available via HTTP at URL:

http://<*FlowForce server*>/service/ salesquery

Delete consumer job

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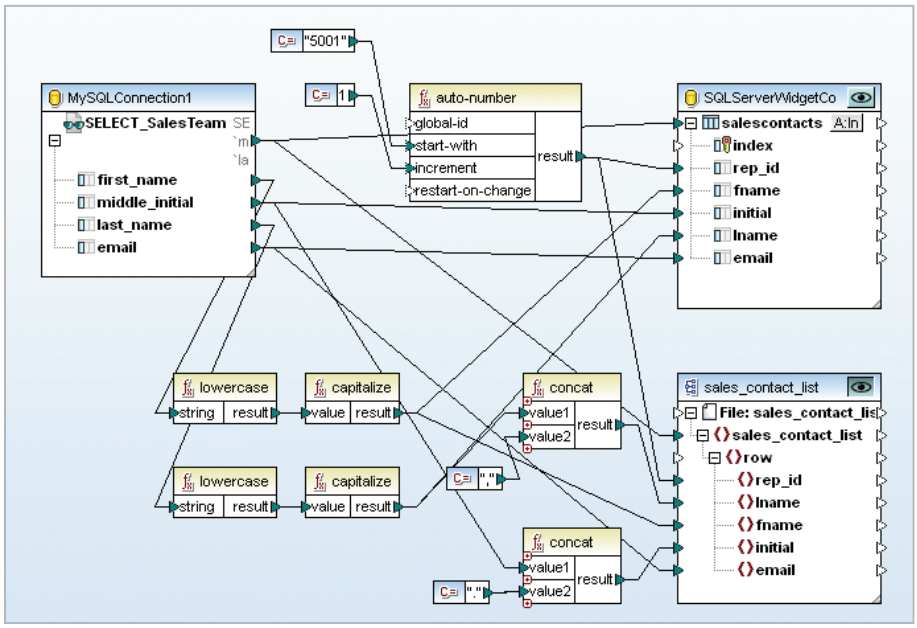
- Sales representatives from the purchased company, whose information is stored in a foreign database, need to be added into the existing organization

The MapForce Platform excels at mapping and transforming data between databases, even databases of different types. You can:

- Map directly from a table in one database to a table in a different database type
- Map from a view in one database to a table in a different database
- Map the results of a SQL query in one database to a different database

A database mapping can also define one-to-many, many-to-many, or many-to-one database integration requirements using any combination of the strategies listed above, or data sources and targets in XML, flat file, EDI, Excel, XBRL, and/or Web service formats.

Here is a mapping to query the employees table in the MySQL database of the acquired company and select members of the sales department to create additions to the SQL Server salescontacts table of the parent company:



The mapping also converts the employee names from all caps to upper and lower case, assigns sales rep ID numbers needed for the product sales reports, and generates a sales rep contact list for internal use.

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Sales Rep Contact List - EU Region

Rep ID	Last Name	First Name		Email
5001	Adam,	Nathaniel	Q.	n.adam@eu.topsprocket.com
5002	Alexander,	Diana	L.	d.alexander@eu.topsprocket.com
5003	Arce,	Harry	E.	h.arce@eu.topsprocket.com
5004	Austin,	Alma	F.	a.austin@eu.topsprocket.com
5005	Baughman,	Robert	L.	r.baughman@eu.topsprocket.com
5006	Berry,	Regina	Y.	r.berry@eu.topsprocket.com
5007	Bishop,	Agnes	I.	a.bishop@eu.topsprocket.com
5008	Blakely,	Derek	S.	d.blakely@eu.topsprocket.com
5009	Box,	Byron	R.	b.box@eu.topsprocket.com
5010	Brownlee,	Guy	V.	g.brownlee@eu.topsprocket.com
5011	Butterfield,	Allen	U.	a.butterfield@eu.topsprocket.com

Mapping | DB Query | Output | HTML | RTF | PDF | Word 2007+

Map_Employees_to_ContactList.mfd

With these steps complete, managers can request daily sales reports for the new region for any product simply by requesting the new region name:

http://vmarketin... vmarketing001

Sales Report Month-to-Date thingamajigs for EU Region

As of: 07 / 15 / 2014

Region month-to-date total sales of thingamajigs:	**119**
Unit price for thingamajigs:	$654.79
Region thingamajigs revenue (US$):	**$77,920.01**
Equivalent in euros:	€57,434.84
Today's exchange rate US dollars to euros:	$1 = €0.7371

Sales Standings:

Quantity	Revenue ($)	Sales Rep ID
29	18,988.91	5020
21	13,750.59	5022
15	9,821.85	5007
15	9,821.85	5017
14	9,167.06	5014
13	8,512.27	5023
12	7,857.48	5003

Report based on data collected at 15:34:20 EST

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Data Integration for Mobile Devices

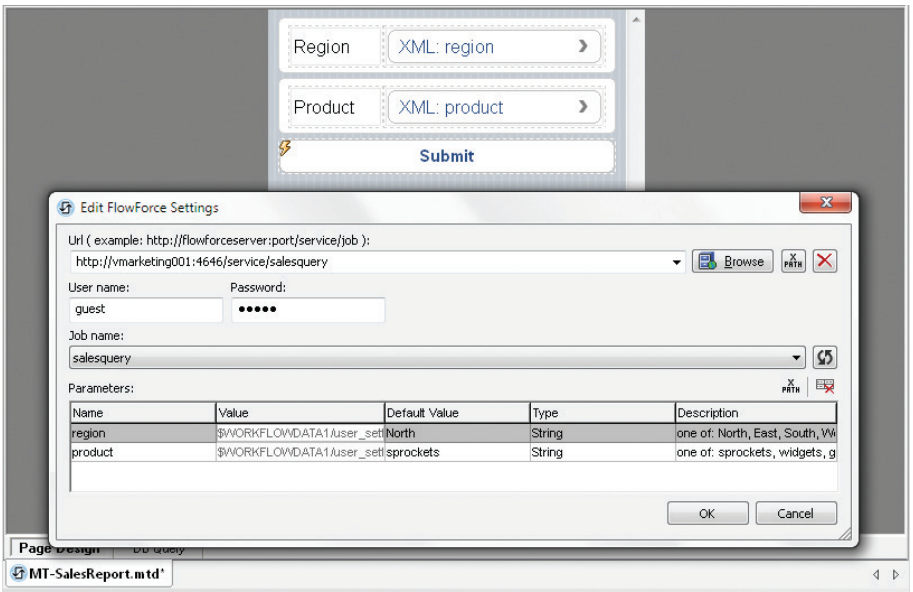
When an offsite manager can read and reply to company email on a mobile phone, it's only a short step to wanting access to all up-to-the-minute company data from the most convenient device all the time.

Yes, the .HTML results shown above can be made available to the Web browsers on mobile phones and tablets, but that's an inferior solution for several reasons. The data will be cumbersome to view and analyze because it is not formatted for each screen size and orientation, and there is no interactive support for user interface controls like buttons, combo boxes, radio buttons, etc., that are built into the mobile operating system.

The MapForce Platform provides a migration path to cross-platform mobile connectivity that does not require Java, .NET, or Objective-C programming experience to create powerful business logic.

Altova MobileTogether is a unique cross-platform mobile development solution that includes functionality to work with FlowForce Server, and by extension MapForce Server, to bring data integration results to mobile devices to integrate business intelligence dashboards, elegant enterprise forms, and much more.

The MobileTogether Designer interfaces directly with FlowForce Server to request job execution and receive results. This means all compute-intensive data integration tasks can be performed by dedicated servers, and only the results need to be delivered to the remote mobile device. A FlowForce Server job is easily defined as a data source during creation of a mobile solution, as shown below.



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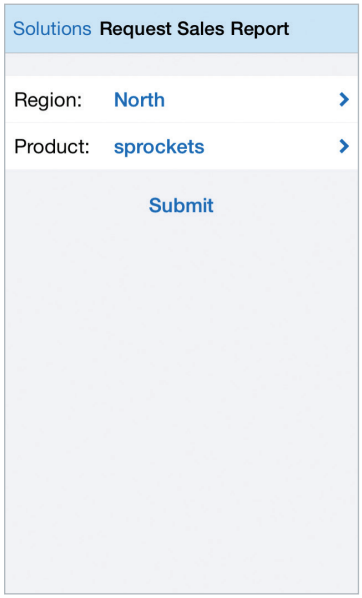
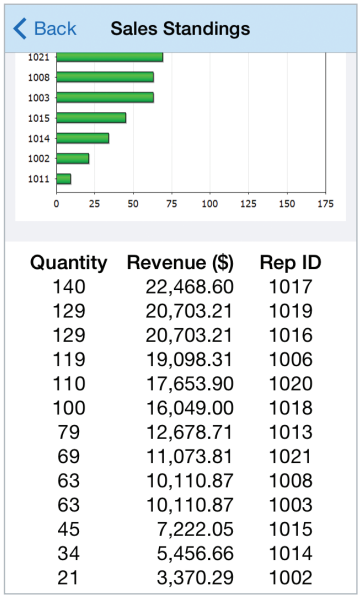
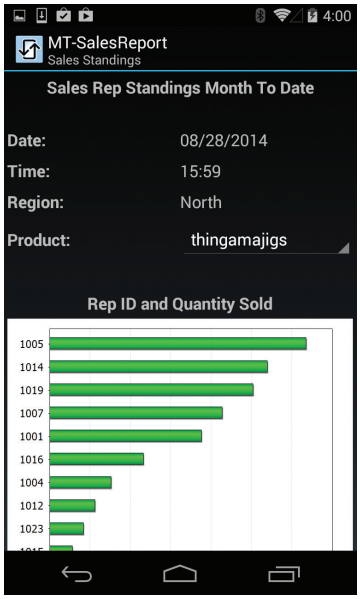
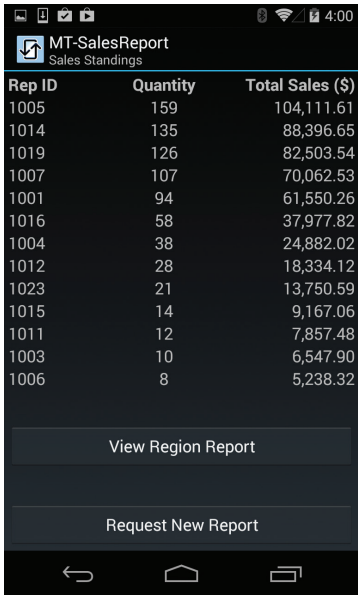
Here's how our sales report example might appear on a mobile phone as a MobileTogether solution: When the solution launches, the sales manager selects the region and product, the sales report is generated by execution of the FlowForce Server job back at the enterprise data center, and the results are displayed, as seen here in screenshots from an iPhone:





A second results page displays the sales rep standings in a scrollable window. Note that the graph is rendered to accommodate the screen size and other features of each specific device. The images below were created from the same MobileTogether solution, but this time running on an Android phone.





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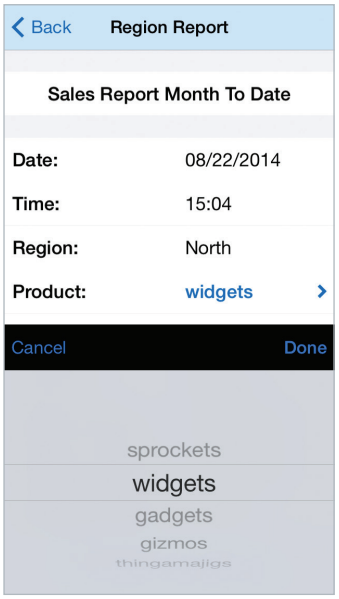
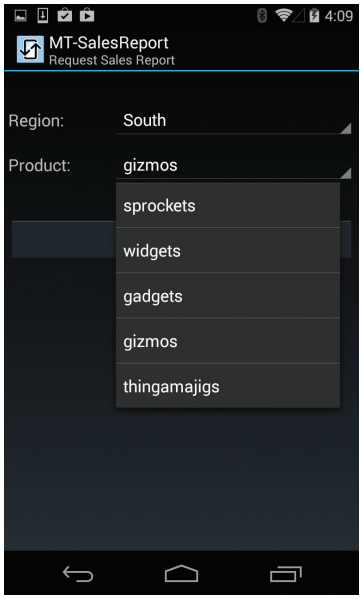
It's likely a sales manager will want to see multiple reports within a region, so a combo box on each report page provides immediate access to other products. The combo box is rendered slightly differently by each mobile device, but the functionality is identical: the user selects one item from a list. Note that the sequence of items is consistent on both platforms, since the sequence is specified once in the MobileTogether Designer.





Development is simplified because all the report data is delivered to the mobile device based on the same MapForce Platform data mappings and integration jobs already defined for the original case study.

It's worth reviewing that the original integration task required combining the results of several SQL queries and a Web Service lookup to deliver the desired results. Result caching with a strategic Cache Refresh Timer empowers FlowForce Server to instantly deliver data on demand to busy managers in the field.

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Considerations to Ensure Success

Choosing a new data integration solution is a decision that can have a long term impact on an enterprise and requires consideration of many issues, with a search for balance between competing needs, requirements, and risks. This section discusses several significant concerns decision-makers must weigh and suggests strategies to reduce initial costs, accelerate implementation, and control long-term maintenance burdens.

- **Initial Cost** – The initial price of a traditional big-iron data integration solution can reach several hundred thousand dollars or more in vendor costs alone, plus added overhead for facilities, staffing, and training. An expense like this will very likely need to be submitted to a budgetary process that is encumbered in time-consuming bureaucratic proposal, review, and appropriation cycles, all of which delay implementation and benefits of using the system in production.

  In contrast, Altova FlowForce Server is a software solution licensed to run on a variety of hardware platforms, virtual machines, or even on cloud-based platforms. A fully-functional FlowForce Server configuration that is well-suited for development, testing, and validation of data integration projects can be licensed for total costs starting at $5,000 or less. This cost differential empowers data analysts to design and implement a real-world data integration solution with low initial cost and minimal budgetary review.

- **Data-centric focus** – The initial price of a traditional big-iron data integration solution can reach several hundred thousand dollars or more in vendor costs alone, plus added overhead for facilities, staffing, and training. An expense like this will very likely need to be submitted to a budgetary process that is encumbered in time-consuming bureaucratic proposal, review, and appropriation cycles, all of which delay implementation and benefits of using the system in production.

  The halcyon days of isolated special-purpose data processing middleware servers are over. Successful enterprises today must collect, integrate, and analyze a universe of interconnected data that moves through fiber-optic cables at the speed of light. FlowForce Server is a data-centric platform for integration, and transformation of data in all common formats. It's all about the data.

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• **How much code-writing?** – Some vendors describe their data integration offerings as software developer platforms or tools to integrate developers and IT departments. These products depend on users creating custom code in .NET, C#, JavaScript, or other programming languages. Writing, testing, and debugging source code can add costly delays to implementation of essential business data integration. Later, as custom code-based solutions are deployed, long-term maintenance and enhancements become growing burdens.

From the graphical design of the MapForce data mapping, to creation of a FlowForce job with a variety of triggers, the Altova MapForce Platform for Enterprise Data Integration can be completely implemented end to end without writing any code. Realistically, most enterprises will want to leverage existing assets in place, such as SQL database views and procedures, customized Excel spreadsheets, or small in-house developed conversion utilities. All these assets and more are completely compatible with the MapForce integration platform.

• **Degree of customization** – Some enterprise data integration systems are preconfigured with “adaptors” to connect disparate systems. For example, adaptors are sold separately for CRM, ERP, or database systems. This functionality is more consistent with a middleware solution than a data integration focus, and could limit customization and flexibility later on, as the enterprise evolves and needs change.

The MapForce Platform for Enterprise Data Integration does not depend on assembling a collection of extra-cost add-ons. Users have complete control over design and implementation of data integration and transformations of all datatypes. FlowForce Server executes all data mappings created by MapForce, supporting any combination of XML, database, flat file, EDI, Excel, XBRL, and/or Web service data. Data integration output can be delivered to any accessible network or cloud-based resource, with access controlled by roles and privileges defined by the administrator.

• **Open-source alternatives** – Open-source software can be attractive due to low initial cost, while exposing the enterprise to a variety of risks. Many open-source platforms must be upgraded to expensive higher-level versions to acquire a robust feature set. Maintenance and support can also add significant extra cost. Recent experience with the heartbleed bug identified in a widely used open-source IP software package has called into question the reliability of open-source alternatives. The US the Federal Reserve, FDIC, and other federal financial regulatory

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agencies outlined various strategic and legal risks of using open-source software in the jointly issued guidance notice "Risk Management of Free and Open Source Software". Many public companies even cite their use of open source as a risk factor to their businesses in annual reports to investors.

• **Level of complexity** – The traditional big-iron data integration products are big, mature, complex systems that are difficult to install and maintain, even for vendor support personnel. They typically employ multiple screens of interdependent configuration settings and dialogs that must be navigated to create each new transformation. The Altova FlowForce Server platform implements a new data transformation based on a single job definition dialog in the easy to use Web-based GUI.

• **Separation of hardware and software concerns** – Altova FlowForce Server is a pure software solution that runs on a variety of hardware platforms, including Microsoft Windows, several varieties of Linux, Mac OS, and even cloud-based virtual machines. The feature set is the same across all supported operating systems. Altova has no stake in sales or maintenance fees for a hardware platform to host FlowForce Server and gains no benefit from bundling the purchase or maintenance of a server platform as part of the solution.

This means you can accurately predict the initial cost to deploy FlowForce Server, and you can choose your own preferred operating environment. You can deploy FlowForce Server on an existing hardware platform, install FlowForce Server on a virtual machine installed on your current high-end server to take advantage of excess capacity, or even install FlowForce Server in the cloud without paying a premium to compensate a vendor for lost hardware revenue.

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Conclusion

Choosing a data integration platform can have a significant and lasting impact in today's interconnected data-driven business environment. If your organization needs to consume, create, integrate, or transform any combination of XML, database, flat file, EDI, Excel, XBRL, and/or Web service, the MapForce Platform for Enterprise Data Integration Platform empowers data architects, analysts, and other IT professionals to efficiently complete enterprise-level data integration tasks.

The MapForce Platform for Enterprise Data Integration Platform is optimized for today's multi-CPU, multi-core computers and servers, and licensed on a per-core basis. That means the MapForce Platform is cost-effective for smaller workgroups or for initial development and validation, and yet any configuration can be efficiently scaled for the scope of larger projects and high-performance hardware as enterprises grow and needs expand.

For more technical details about the features of the MapForce Platform for Enterprise Data Integration Platform, visit the Altova FlowForce Server product pages at **http://www.altova.com/flowforce.html**, the MapForce product pages at **http://www.altova.com/mapforce.html**, and the StyleVision product pages at **http://www.altova.com/stylevision.html**.

You can download a free fully-functional 30-day trial at **www.altova.com/download.html**.

Free online training for Altova MapForce, StyleVision, and a variety of related topics is available at **http://www.altova.com/aot/online-training.html**.

About Altova

Altova® is a software company specializing in tools that assist developers with data management, software and application development, mobile development, and data integration. The creator of XMLSpy® and other award-winning products, Altova is a key player in the software tools industry and the leader in XML solution development tools. Altova offers a complete line of desktop developer software for XML, SQL, and UML; high-performance workflow automation server products; and a cross-platform mobile development platform. With over 4.7 million users worldwide, including 91% of Fortune 500 organizations, Altova is honored to serve clients from small and medium-sized businesses to the world's largest organizations. Founded in 1992, Altova is headquartered in Beverly, Massachusetts and Vienna, Austria. Visit Altova on the Web at: **http://www.altova.com**.

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