Bringing Together the Worlds of SAP® and Microsoft Technology

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SAP® Gateway technology for Microsoft provides a unified platform for integrating Microsoft productivity tools such as Microsoft Office, Microsoft Project, and other Microsoft-based environments. Through the use of this development framework, employees can work with critical business information stored in SAP® Business Suite software, the SAP HANA® platform, the SAP Business Warehouse (SAP BW) application, and other SAP software in a low-cost, highly transparent, and secured approach in a Microsoft environment.

THE CHANGING DEMANDS OF TODAY’S WORKFORCE

Today’s workforce is different in ways never before seen. Knowledge workers demand easy and transparent access to critical business information to perform their jobs. This forces decision makers to take responsibility for their own employee retention and the ease of essential work environments.1 In addition, line-of-business owners must partner with IT to make work fun and easy for their employees.

With the convergence of this business dynamic, referred to by Gartner as “consumerization of information,”2 a consumer-based approach to business computing provides business users with simple, enterprise-ready tools to get work done. Whether housed in on-premise, cloud, or mobile applications, business information must be accessed quickly while enabling workers to perform daily operational tasks in a secure, easy-to-maintain manner across the entire enterprise software landscape.

Normally, diverse and complex tasks demand access to information stored in multiple systems, governed by uncoordinated processes, and contained with multiple layers of security – all of which inhibit easy execution. Since knowledge workers spend half their time on interactions, research suggests that companies should first explore the productivity barriers that impede these interactions.3 Common barriers may include a lack of clearly defined expectations and outcomes, competing information sources, and basic information accessibility issues such as a complex, nonnative user interface (UI).

In recent years, many companies have taken a hard look at the need to increase access to critical business information that exists in back-end systems across lines of business and functions. As a result of this analysis, some companies have found that there is a gap between information accessibility and use. In an ideal situation, all workers should be directly connected to back-end

3. Ibid.
SAP systems that allow them to access information directly and quickly to execute processes efficiently. However, for most SAP customers, only a small number of business users are directly working on SAP systems, while the remaining user population accesses critical information through unsupported third-party or home-built integrations. Although this approach may address specific user needs in the customer environment, an enterprise-ready and native integration option would provide lower overall total cost of ownership (TCO) while achieving similar benefits.

Considering that there are 1 billion Microsoft Office licenses worldwide, it is easy to see that a typical SAP customer would have business access to Microsoft productivity tools, such as Microsoft Office and Microsoft Project. In addition, these business users are increasing their day-to-day consumption of business-critical information through mobile and non-PC channels – with more and more information consumed through smartphones and other mobile devices. By 2015, most business users will access critical information through mobile and non-PC based applications versus PC-based applications and UI modes. This predicted trend further supports the need for broad integration between enterprise data services offered by SAP and commonly used productivity environments such as Microsoft Office.

In response to this growing need, SAP has developed a solution that provides an extended set of tools and connectors that help create bidirectional communication between the SAP stack and Microsoft platforms in a secure, development-friendly approach. SAP Gateway for Microsoft is the latest enterprise-ready development tool that provides smooth interoperability with Microsoft productivity environments and is based on the architecture of SAP Gateway technology, which already has more than 4,500 productive customers. As a result, this single, unified, and fully secured platform brings together SAP and Microsoft environments in a model that enables low-cost integration and highly secure data.

This paper provides some background on SAP Gateway for Microsoft and the many advantages it offers when integrating SAP and Microsoft productivity applications. Further, this paper features a number of business-case scenarios in which the development tool can help an organization realize ROI quickly and lower total cost of development by using development templates and streamlined .NET development flows that use Open Data Protocol (OData) capabilities.

4. Microsoft Corporation, “Microsoft by the Numbers.”
5. “Research firm IDC suggests that global downloads of applications will exceed 75 billion by 2014, an increase of nearly 8x since 2010,” IDC Mobile Application Survey.
When considering a number of heterogeneous system approaches, it is important to balance three critical elements across the work and information landscape.

**People who perform work tasks**
Enabling people to work in their most natural environment makes them more productive through the best possible user experience (UX). With Microsoft productivity applications, knowledge workers have access to a uniform productivity UX across its customer base. Therefore, it is important to balance the availability of highly accurate SAP information with Microsoft productivity applications.

**Processes used to complete work tasks**
Management can make timely, accurate, and actionable decisions with tightly integrated processes and data as a widely regarded, company-wide best practice. Enabling those processes from SAP business systems and allowing work steps to be completed with Microsoft applications helps bring work and processes together with critical business data.

**Systems combined with information and used as inputs and outputs to tasks and processes**
Smooth interoperability between multiple technologies creates system agility. Balancing the best of SAP and Microsoft technologies makes it easier to access business-critical data through clear work steps without introducing more complexity with external third-party systems, while helping to ensure enterprise security.

Each of these elements is important when considering the execution of work tasks in the enterprise. Very often, integration is a complicated patchwork of bolt-on solutions – which incurs high costs and generates low productivity when people, processes, and systems are not considered. Oftentimes, redundant effort and creation of inaccurate or misinterpreted information causes rework, skepticism, and anxiety in the workplace. By using a balanced approach, new levels of effectiveness can be achieved in Microsoft application environments when supported by SAP enterprise information.
A New Approach to Consumerize SAP Data Through Microsoft Productivity Tools

According to a number of informal polls conducted by Microsoft Visual Studio forums, between 8 and 15 million developers around the world build application services by using the .NET platform. The .NET platform is an integral component of the Microsoft Windows operating system for building and running next-generation software applications and Web services.

By broadening the scope of its integration-product family across SAP Gateway technology, the .NET platform delivers a consistent UX and data flow for current Microsoft users. By applying the OData architecture supported by SAP Gateway for Microsoft, Microsoft developers can access a variety of SAP data sources through an ADO.NET client layer and bring this information into specific Microsoft application environments with sound governance and security. And all of this is possible, even when developers have no or limited knowledge about SAP data and structures.

Figure: Architecture of SAP Gateway for Microsoft, which supports a number of enterprise readiness features

7. Various, including Microsoft Visual Studio blog, informal Microsoft responses on Quora based on early 2013 estimates.
By enhancing the robust architecture of SAP Gateway, SAP Gateway for Microsoft combined with ADO.NET provides a number of additional features:

- **Smooth integration:** An enhancement of OData developed by SAP allows bidirectional annotations to data structures. Combined with additional extensions and development templates accessed through Microsoft Visual Studio, developers can tap into business-critical information from SAP software, such as the SAP HANA platform, the SAP BW application, and SAP Business Suite software.

- **Quick development:** Once OData services are exposed and discovered in Microsoft Visual Studio, developers can select an automated code generation feature to quickly provide enterprise-ready connectivity from Microsoft productivity tools to SAP Data Services software.

- **Ease of business use:** Solutions developed with SAP Gateway for Microsoft are deployed as add-ons to Microsoft productivity applications.

- **Secure user access and policy management:** To help prepare the enterprise with single sign-on (SSO), SAP Gateway for Microsoft serves as a conduit for secure data connectivity with SAP enterprise services, sophisticated data encryption, centrally managed and integrated group security polices, and X-CSRF token handling.

- **Reduce cost of ownership:** Overall TCO is minimized by leveraging previously made investments in both Microsoft and SAP software technologies and skills and by reducing development costs.

- **Monitoring and supportability integration:** The SAP Solution Manager application management solution enables end-to-end tracing with a unique SAP object ID. The application management solution facilitates error tracking and IT system audits, such as segregation of duties for Sarbanes-Oxley and related governance requirements.

- **Flexible use scenarios:** Development templates for most common business scenarios and application environments – such as Microsoft Outlook and Microsoft Excel – ease the launch of productive scenarios.

While SAP Gateway for Microsoft currently leverages the ADO.NET client protocol, future plans include leveraging the ADO.NET server layer to enable connectivity to cloud-based Microsoft Office 365 or Microsoft Azure applications. Backward compatibility exists for enterprises still taking advantage of Microsoft Office 2010 environments.
With SAP data and developer templates stored in the Microsoft Visual Studio environment, Microsoft development teams can quickly access critical data from an SAP source without the need to learn SAP development skills, such as the ABAP® programming language. Development of certain functions that normally take considerable time can now be created with configuration options prior to generating code automatically. For example, a developer may select specific forms to add as part of a workflow scenario – choosing forms as an SAP service reference through SAP Gateway.

Organizations that are currently using other elements of SAP Gateway technology, such as Duet Enterprise software for Microsoft SharePoint and SAP applications, will find that SAP Gateway for Microsoft complements their Microsoft environment. While Duet Enterprise continues to remain an excellent method for integrating Microsoft SharePoint with SAP applications, SAP Gateway for Microsoft allows for tighter integration of scenario and business processes across multiple Microsoft environments. SAP data is displayed, updated, created, and deleted based on the OData services and SAP authorizations, directly from Microsoft productivity tools without having to log on separately to SAP business applications. In combination with this secure and unified platform architecture, Microsoft users can use an SSO approach to access productivity applications that contain critical, SAP-based information.
Key Benefits for Users, Developers, and Line-of-Business Owners

As part of a comprehensive integration approach for Microsoft applications, SAP Gateway for Microsoft provides users of all areas critical advantages, such as:

- **A consistent UX and process-driven data flow from their Microsoft application environment.** Without the need for training or development of data queries, business users can focus on executing tasks associated with their daily responsibilities.

- **Use of the already-familiar Microsoft Visual Studio environment – with SAP data extensions and a built-in developer toolkit.** This capability enables .NET developers to create solutions that integrate with the native SAP data environment quickly and efficiently. And with development templates, this practice is further accelerated. Because SAP Gateway for Microsoft auto-generates security features for quick connectivity to SAP Data Services, developers are no longer required to learn security and supportability aspects of systems integration.

- **High-value benefits and low TCO by employing a secure, integrated environment to replace costly point-to-point solutions.** IT management can achieve additional ROI by reducing maintenance costs when replacing complex third-party or custom-built environments commonly used for integration solutions. Auditing and legal requirements are fulfilled with greater ease with built-in integration with SAP supportability and monitoring software, including SAP Solution Manager and the system landscape directory of the SAP NetWeaver® technology platform.

- **High value-to-cost ratio when considering business-process enablement across multiple Microsoft applications and SAP software.** Line-of-business leaders of cost-center driven organizations can decrease IT operating costs and increase user productivity – boosting profitability.

One of the quickest ways to realize value when introducing new work, processes, and systems is the adoption of incremental benefits in an organization, where need is great and user levels would be high. Over the years, companies are allowing time for a proof of concept to introduce changes in small, defined work communities to test a new approach to processes and systems before undergoing an enterprise-wide implementation. SAP Gateway for Microsoft helps companies scale up from a proof of concept to a large-scale productive implementation by providing enterprise-ready features such as SSO and supportability.
In addition, SAP Gateway for Microsoft provides a number of development templates that cover common scenarios, including:

- **Contact** – Oversee customer or vendor records directly from Microsoft Outlook.
- **Calendar** – Manage common calendar-based scenarios, such as applications for leave requests or time tracking.
- **Workflow** – Expose any decision-making workflows, such as approvals for purchase orders or vacation leave.
- **Microsoft Excel** – Manage mass data, including multiline updates of SAP data directly from Microsoft Excel.
- **Unlimited possibilities with custom scenarios** – Construct other applications by using OData protocols in Microsoft Visual Studio to enable enterprise requirements across Microsoft productivity tools and SAP Data Services.

With the flexibility to facilitate these scenarios, SAP Gateway for Microsoft allows companies with investments in both SAP business software and Microsoft applications to integrate their data together on one complete platform.
Getting Started and Realizing Value Quickly

The following scenarios are available with development templates provided by SAP Gateway for Microsoft. Additional extensions may be added as feature customizations.

**Purchasing optimization with contacts and workflow development templates**
Vendor management enables teams to define daily activities such as meeting scheduling and contact management, while operating in an enterprise-wide environment. With this scenario, business users access critical vendor information, schedule interactions, and record notes based on these interactions. All of this information can be stored offline and online in a central SAP data repository.

Team members who access Microsoft Outlook can quickly identify vendors, contact groups, and other information stored in the vendor record. Users can pull vendor contact information directly from SAP software into Microsoft Outlook and make it available online and offline in real time. This avoids the cost and confusion of maintaining separate contact lists in personal Microsoft Outlook .ost files, which are traditionally migrated, cleansed, and stored in vendor databases. When vendor information changes or a new contact is added, the contacts database located in an SAP back-end system is updated directly by Microsoft Outlook. By using Microsoft Outlook tasks to facilitate workflow integration, purchasing teams can manage vendor contract documents, approvals, and other basic contracting and fulfillment steps. Each progression updates the given state of the purchase, vendor information, and approvals, which are then updated in the SAP vendor master record.

**Product data management through a development tool based on Microsoft Excel**
Master-data information for products can change quite frequently. Updating one product can easily be done. But when prices go up, descriptions have to be altered or other changes are required, which impact all products. As a result, it is possible that thousands of lines of data would need to be updated. This also includes customer-facing online product catalogs, as well as supplier-facing requirements for components and subassemblies. In addition, product development groups often use Microsoft Excel to locally update bills of materials (BOMs), which can then become an engineering BOM, manufacturing BOM, and service BOM by pulling from the product data master and the material data master records.

Combining relevant SAP data with Microsoft Excel allows end users to work on the data by using a spreadsheet. Standard Microsoft Excel functionality – such as formulas, sorting, filter, and auto-fill – can be applied to the data. Plus, SAP-specific functions – including data-type validation, the Help Value drop-down function within the SAP system, and conflict resolution – enable multiple people to work on the same set of data at the same time.
In a software landscape that includes SAP Gateway for Microsoft, OData commands can map specific SAP part and material master data and information from other Microsoft Excel sources without the need for integrating third-party business intelligence solutions. By having the ability to quickly upload product and material data chances, engineering teams can help ensure engineering, manufacturing, and service BOMs are correct with the SAP data source. This enables users to avoid waiting for planned engineering review cycles and to proactively alert manufacturing areas to necessary machinery and tooling changes as new part changes are logged within the SAP system through the SAP Production Planning Rapid Mart package. Planned updates and revisions can be entered by using Microsoft Excel.

**Plant maintenance and repair by using calendar, contacts, and development-workflow templates**

Plant maintenance activities are regularly scheduled events across industries, such as manufacturing and utilities. Proactively scheduling maintenance or working on a repair creates the imperative to manage capital and human resources. The SAP Plant Maintenance Rapid Mart package gives workers the ability to schedule equipment downtime and assign resources to maintenance, repair, and operations (MRO) activities.

Schedulers can use the Microsoft Outlook calendar with enterprise-ready commands found in SAP Gateway for Microsoft to define the start and end times of maintenance and repair activities. The calendar item can also incorporate contacts found in Microsoft Outlook to publish an event of the activity. Using a Microsoft Outlook task, approval workflows for the MRO activity can then be delivered to plant management and service departments for final sign-off. Once approved, the scheduled MRO activity is then updated within SAP Plant Maintenance Rapid Mart. This process shortens the scheduling cycle and allows plant maintenance teams to focus on maintaining equipment and gathering necessary personnel to complete MRO activities.
Conclusion

High-performing companies that understand the value of supporting knowledge-worker environments with intuitive, enterprise-ready systems and processes can achieve a competitive advantage by operating in a more focused, regimented manner. By bringing together the power and accuracy of real-time critical information from SAP with the familiarity of Microsoft productivity tools, organizations can build the workplace of tomorrow while applying existing in-house development skills and IT investments.

For more information about SAP Gateway for Microsoft, visit www.sap.com/interoperability-microsoft.