

Accolade® Enterprise Innovation Performance:
**Integration to Third-Party
Applications**



Abstract

This Brief introduces the advantages and benefits of integrating Sopheon’s Accolade enterprise innovation performance solution to third-party applications. Since the needs and requirements for data exchange between Accolade and other systems will vary from organization to organization, we allow for multiple technical approaches to integrating the solutions. This paper provides a high-level overview of the various approaches, as well as a deeper-dive description of the API-based approaches.

Why Accolade and Third-party Applications Together?

Accolade continues to evolve as an “enterprise system of record” for many Sopheon customers as the software is pulled into managing increasingly inter-related portfolios. This movement requires ongoing development to allow simple integration of multiple data sources and ecosystems to further enrich the insight and intelligence offered by Accolade. The fundamental questions are “What data needs to be exchanged, and when does that exchange need to occur?”

Accolade’s functionality and value center on its capacity to capture and provide access to the data needed for project and portfolio management decision-making. Integration of third-party applications to Accolade should be based on how the data in the third-party application can be used to support the decisions required during the lifecycle of a product. Accolade is generally used very early in the lifecycle to collect and manage new product concepts and to foster decision-making around those concepts in order to optimize the return from R&D and other investments in product innovation. Once the cycle begins, Accolade serves as a decision-support and process-management application to ensure that best practices are followed throughout new product development (NPD) and that key NPD attributes and decisions are collected and retained.

In a common integration scenario, third-party applications function later in the development process when costs and schedules need to be identified and technical designs created. In another scenario, post-launch product data, such as sales volumes, are linked to decisions made early in the development process (which are captured and stored in Accolade). The diagram below depicts this relationship.

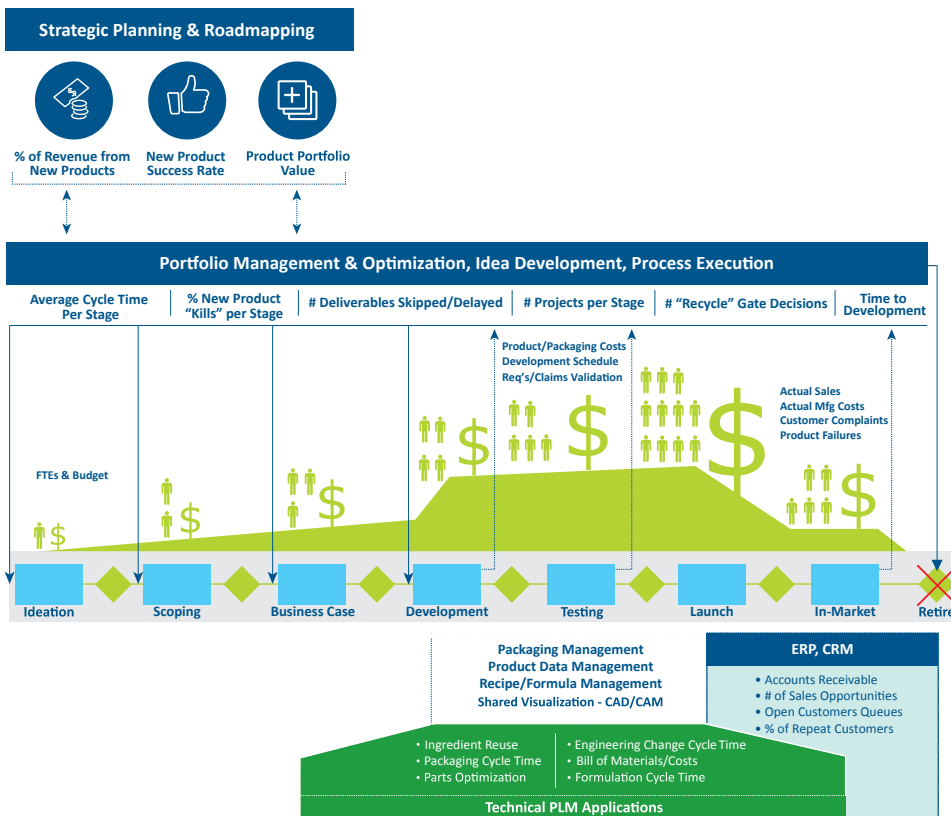


Figure 1:
The complementary relationship between Accolade and third-party applications. Third-party applications can serve as a data source for business decisions supported in Accolade, while Accolade can feed business data relating to product, market and innovation processes back into those third-party systems.

In a typical R&D process, third-party applications are used to generate items such as material requirements, cost estimates, and production plans. Most of the data that is created outside Accolade is not required for Accolade to perform. It follows that, when planning the integration of third-party applications with Accolade, it is important to consider how information derived from those systems will be used. If such information is important to portfolio management decision-making, it needs to be made accessible. Such information should be included in the Accolade integration design. Likewise, if information from Accolade is an important component of the design process, it should also be included in the integration design so that it is available to the third-party application.

To assist with development of an integration plan, Sopheon has created a software-vendor independent Innovation Master File that contains a master scope of attributes which are part of the innovation and product lifecycle processes. Sopheon has experts who can assist in mapping the definitions contained within the Master File to your business.

Examples of data that is generated in third-party applications that may be useful in Accolade include:

- Cost data such as material, equipment, plant, or production costs;
- Schedule data such as product volumes and dates;
- Timesheet data;
- Sales / volume data;
- Product market-performance indices.

Examples of data that is generated in Accolade that may be useful in third-party applications include:

- Product overviews and requirements;
- Market data;
- Schedule dates (gate dates);
- Key innovation assumptions and frameworks.

Since Accolade was launched in 2001, we have seen repeated validation of Accolade's strong integration capabilities through initiatives carried out by our customers with no assistance from Sopheon's Services organization. We have had customers work successfully on their own to create integrations to SAP® tools (both the FICO and ProjectSystem modules), CRM systems (Salesforce.com and others), ASD, Dassault Systèmes, Oracle® Financials, Oracle PLM and Oracle ProdiKa (Agile), Lotus Notes®, Selerant, business intelligence systems including Qlik, Tableau and Tibco, and other homegrown database applications.

Integration Alternatives

A key learning emerging from our experience with Accolade integration is that the requirements of customers for data exchange vary significantly. To address these variations, this paper presents several approaches for integrating Accolade to third-party applications.

API-Based Integration (bi-directional)

This is the most advanced form of automated data integration and the most complex. It requires programming to the Accolade and/or third-party API. This approach makes the most sense when the objective is a completely transparent integration that simply runs in the background. Advantages of this approach are its high degree of unattended automation and its ability to handle large amounts of data. Disadvantages include the need for IT staff to implement and maintain the approach.

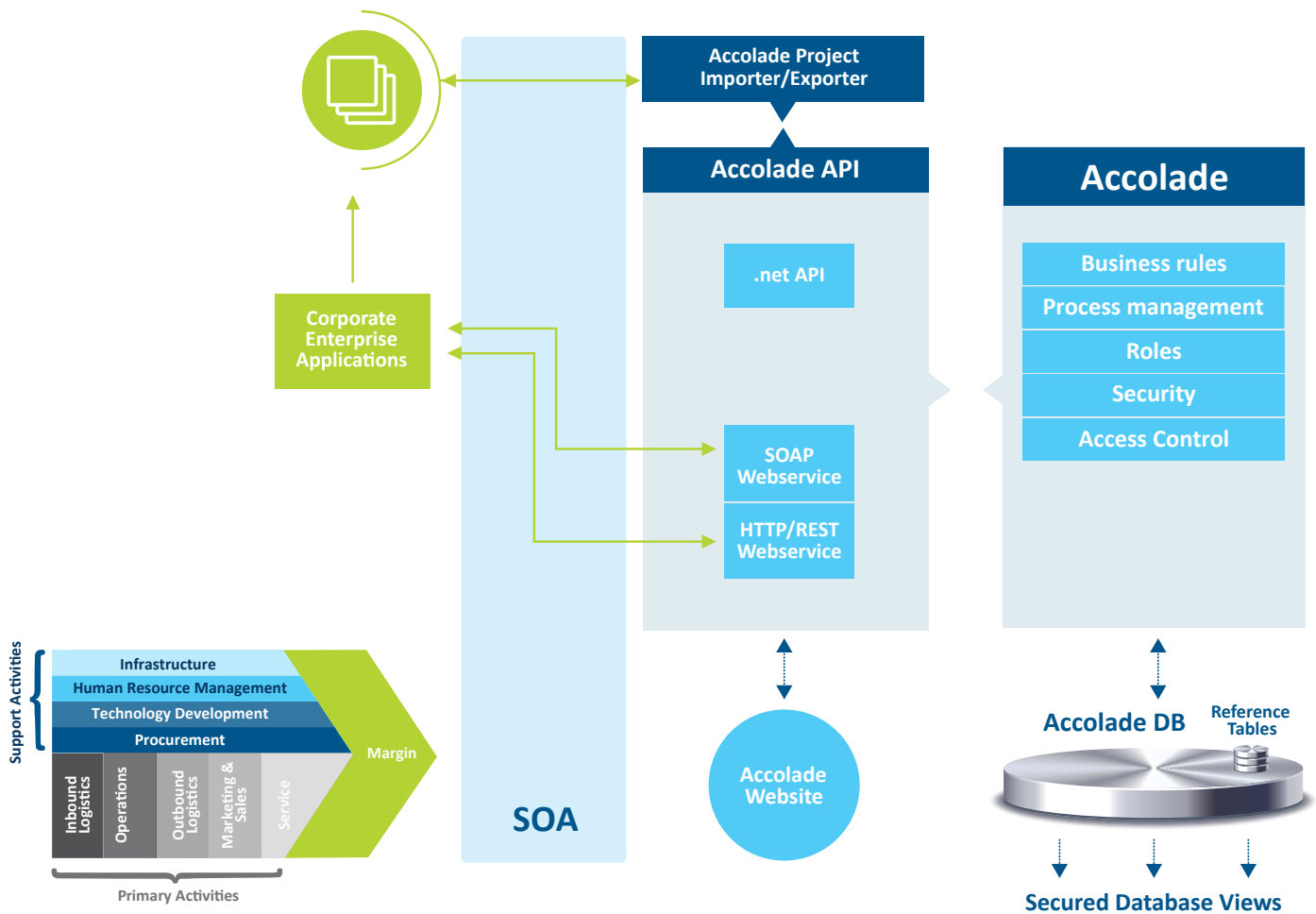


Figure 2: The Accolade API Integration.

Enterprise Application Integration (bi-directional)

This approach makes the most sense when the use of enterprise application integration (EAI) software is desired. The EAI product serves as an integration broker. Sopheon provides a set of Simple Object Access Protocol (SOAP) web services or RESTful HTTP web services, which can be hooked up to EAI middleware products, as well as a framework for extension of the SOAP interfaces, as desired.

The advantages of this approach include the ability to configure unattended automation and data transformations via the EAI product and its ability to support multiple disparate systems. The disadvantage is the need for IT staff to implement and maintain the integration on an ongoing basis.

Organizations that are implementing an enterprise services bus (ESB) should consider this integration approach.

Project Importer Integration (third-party to Accolade)

Accolade has the ability to fetch data into reference tables automatically. Reference tables can be used in Accolade for advanced business analytics and decision-making. This data can also be used to update Accolade information (metrics and metadata) *en masse*.

Accolade can be configured to observe a network file share location and automatically load into reference tables any data files – Microsoft Excel or Comma-Separated Value (.csv) files – that are placed in that location. Many third-party applications can be configured to produce .csv or Microsoft Excel export files on a scheduled or on-demand basis and to drop those into the network file share. In this way, data can be imported automatically into Accolade. This approach can be configured to create, update, or delete items in Accolade.

This automated integration approach is the easiest for batch integration for multiple projects as well as for non-project related data such as product definitions, specifications, variants, sales data, and financial data. An advantage of this approach is its ability to handle large amounts of data and its ease of setup.

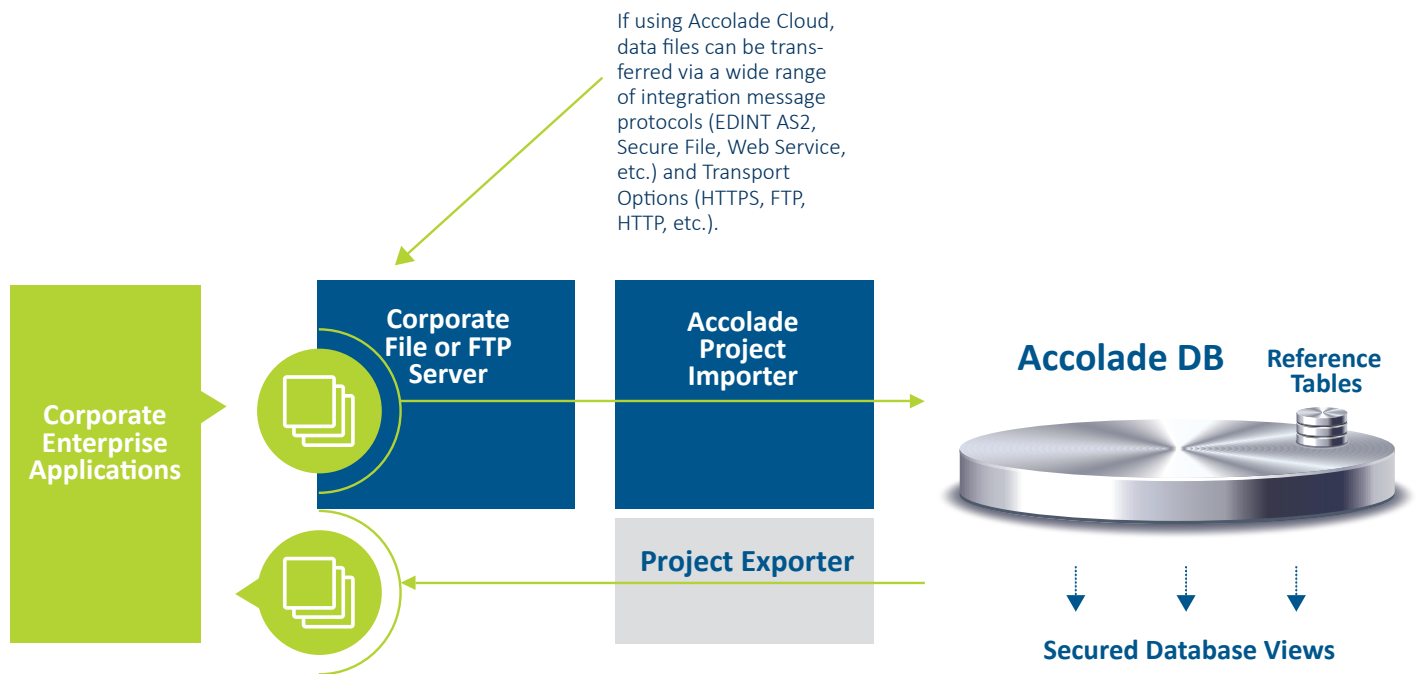


Figure 3: The Accolade Project Importer.

Project Exporter Integration (Accolade to third-party)

Accolade has the ability to export information automatically to Microsoft Excel or Comma-Separated Value (.csv) files. Any Accolade Report can be configured to Export to a file. This file is saved to the Accolade Application Server file system and then can be transferred by integration middleware to any desired location. This data can then be used to update any external system. This approach is configured through the Accolade User Interface and does not require any programming to extract data available to Accolade Reporting.

Two-Way Microsoft® Office-Based Integration (third-party to Accolade)

Accolade has the ability to read information from Microsoft Office documents and to update project-related data elements (i.e. metrics) via its “smart Office” functionality. This is an ideal approach when the volume and frequency of data transfer between Accolade and third-party applications are low to moderate, and the manual approach is considered undesirable.

An Excel-based report containing required information for a single Accolade project can be generated by many third-party applications, and then loaded into Accolade as a gate deliverable. The built-in capability of Accolade to extract data from a Microsoft Office document completes the data transfer.

This is the simplest form of automated data integration, and the easiest for single project integration. It requires no programming. Frequently one user runs a report to extract the data from the third-party application into a pre-defined Excel template, and a second user stores this template into Accolade. One advantage of this approach is that it allows the Accolade team to view and validate the data before it is made available to the broader Accolade community.



Figure 4: The Accolade Microsoft Office Integration.

Embedded Applications (Integrated into Accolade User Interface)

Accolade provides a mechanism to integrate existing application portals seamlessly into the Accolade user interface. This integration provides users with a simple way to access internal resources without having to navigate away to find them. This can be configured in Accolade in a number of ways – through Global Links, Project Related Document Links, Global Layouts, and Project Layouts.

Manual Integration (bi-directional)

Manual integration of data is the easiest and most commonly-used approach. While this approach is sometimes discounted, it is often the case that the amount of data to be transferred and the frequency of transfer are such that the complexity of automated integration simply does not make good business sense. In these instances, cut-and-paste goes a long way toward achieving a cost-effective, easy-to-implement integration.

If only a few data items are to be transferred a few times per month for each project, then manual integration should be considered. However, one requirement of this approach is that the user be able to access both Accolade and the third-party system, and that he/she be trained in both. When it is not possible or practical for a user to have access to both systems, a report from one system can be used to generate the required information. This information is then keyed into the other system.

Custom Plug-Ins

Accolade Plug-Ins are drop-in components that allow the Accolade application to be extended with new end-user features, functionality, or REST Web API methods. Accolade Plug-ins are compiled Microsoft MVC.Net Assemblies which use Object Oriented design principles to provide loosely-coupled and highly secure extension points to built-in Accolade capabilities while enforcing the product's core security model and business rules.

Secure Database Views (Accolade to third-party)

Accolade provides secure database views that can be accessed by third-party systems to extract key data from Accolade. This approach would allow a programmer of the third-party application to extract information via an SQL

query against the Accolade database. This approach is recommended for a programmer who wishes to extract information from Accolade via an SQL query as opposed to calling the Accolade Application Program Interface (API) directly.

API-Based Integration Approaches

Linking Identifiers

Linking identifiers are used to establish a relationship between a project in Accolade and one or more items residing in a third-party application. When an item is created inside the third-party application, its identifier code can be easily entered into Accolade via an online form. Once this is done, Accolade has everything it needs for a more sophisticated level of integration with the third-party system.

Accolade-Centric

This approach pulls data from the third-party system into Accolade. In this scenario, an event prompts Accolade to request and manage the transfer of data to or from the third-party system. An Accolade event is used to initiate a pull mechanism that uses the third-party API to extract data from another application. The Linking Identifier is used to indicate which items inside the third-party system should be accessed. The data transferred using this mechanism varies from organization to organization, depending on the way in which Accolade and the third-party application are configured. The Accolade event could be project-related (e.g. a “Go” decision entered at a gate or entry of a “completed” status for a deliverable or task). It could also be generated by a user (e.g. pushing a button in the Accolade user interface or double clicking an icon on the Microsoft Windows® desktop).

Third-Party-Centric

In this approach, the third-party system initiates and manages the data exchange with Accolade. Third-party applications can use Accolade’s web service API to request data from Accolade and/or to store data inside Accolade.

Timed Task

In the previous examples, it was assumed that a particular user or system event triggered the integration mechanism. To completely automate the integration in both directions, a timed task could also be used. The task could be set to run at any interval from less than a minute to more than a week, depending on the specific needs of the organization.

Blended Approach

A combination of the preceding approaches can also be used. For example, Accolade can automatically create a timesheet project in another system when a project in Accolade passes a certain gate. In this approach, the Linking Identifier can be set automatically. Once this is done, the data exchange mechanism can be Excel-based. This set-up precludes the need to establish and maintain a more sophisticated API-based integration.

Accolade is designed to work with other systems; these are a few examples.

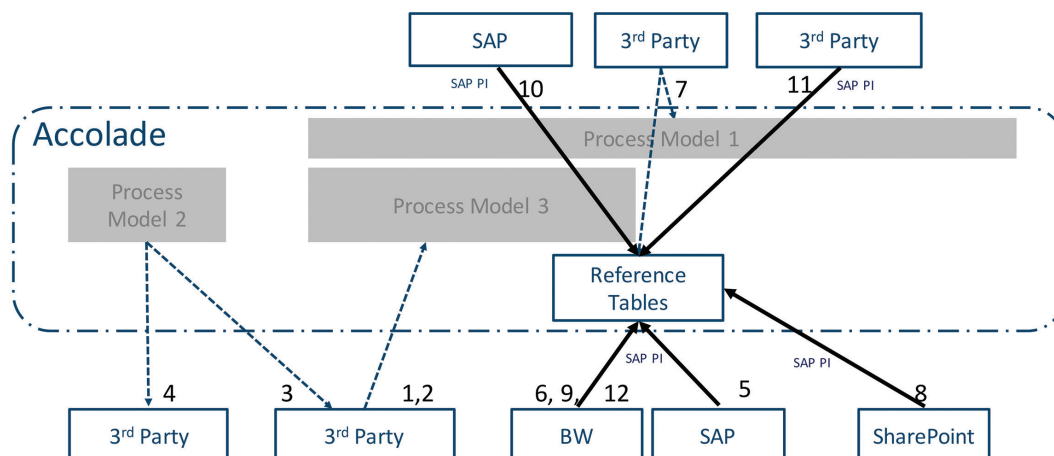


Figure 5: Example of a multi-third-party approach.

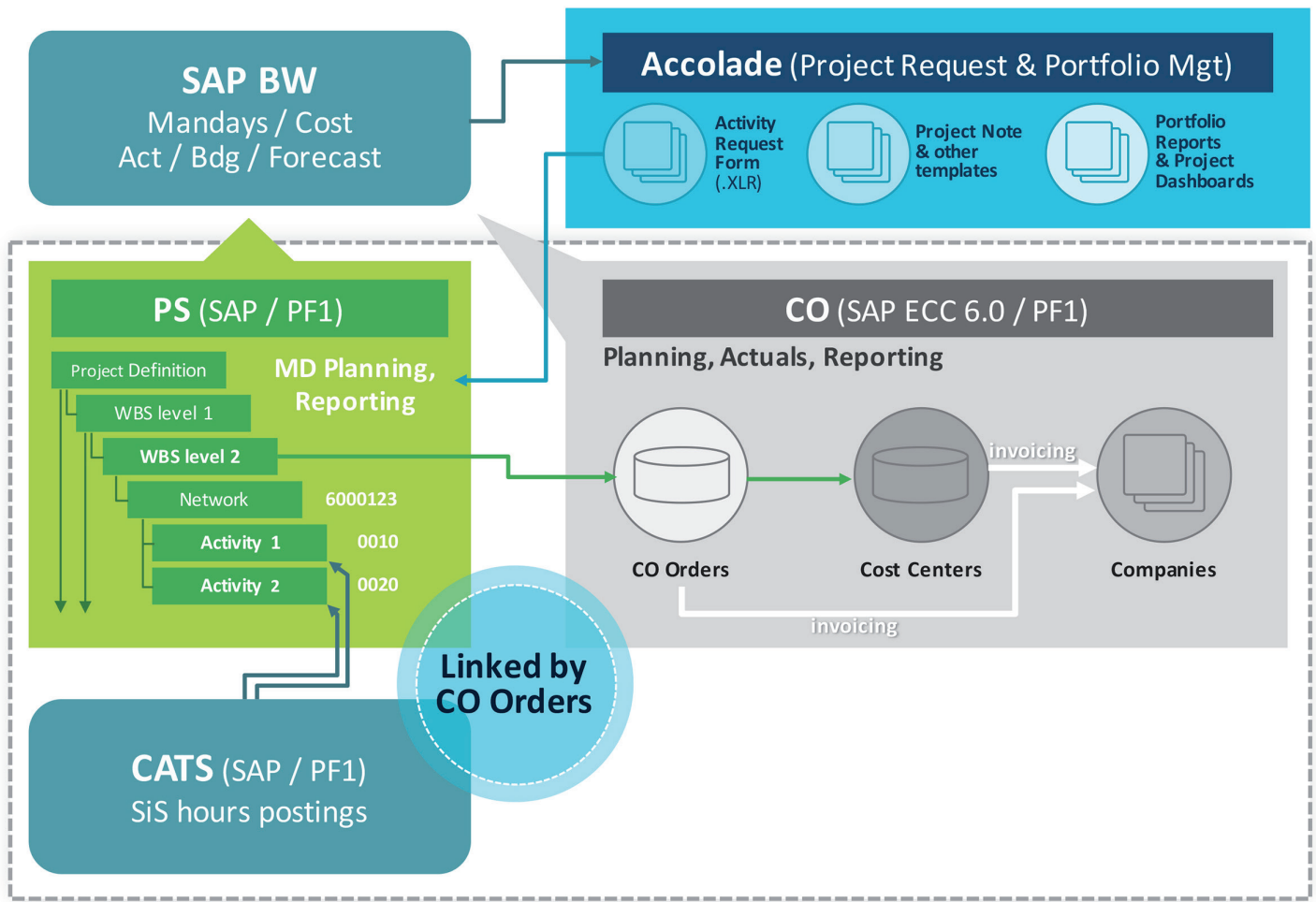


Figure 6: Example of how Accolade can work with SAP to provide a complete picture.

The Accolade API

Web API 2.0 enables support for full REST standards for create, read, update, patch and delete operations. The API also enables multiple forms of authentication. Accolade’s API conforms to the Richardson Maturity Model Level 2. It is implemented with ASP.Net Web API 2.2 with attribute routing, and follows OData v3 conventions.

The figure on the next page illustrates the various forms of the Accolade API that are used to establish programmatic integration to third-party systems.

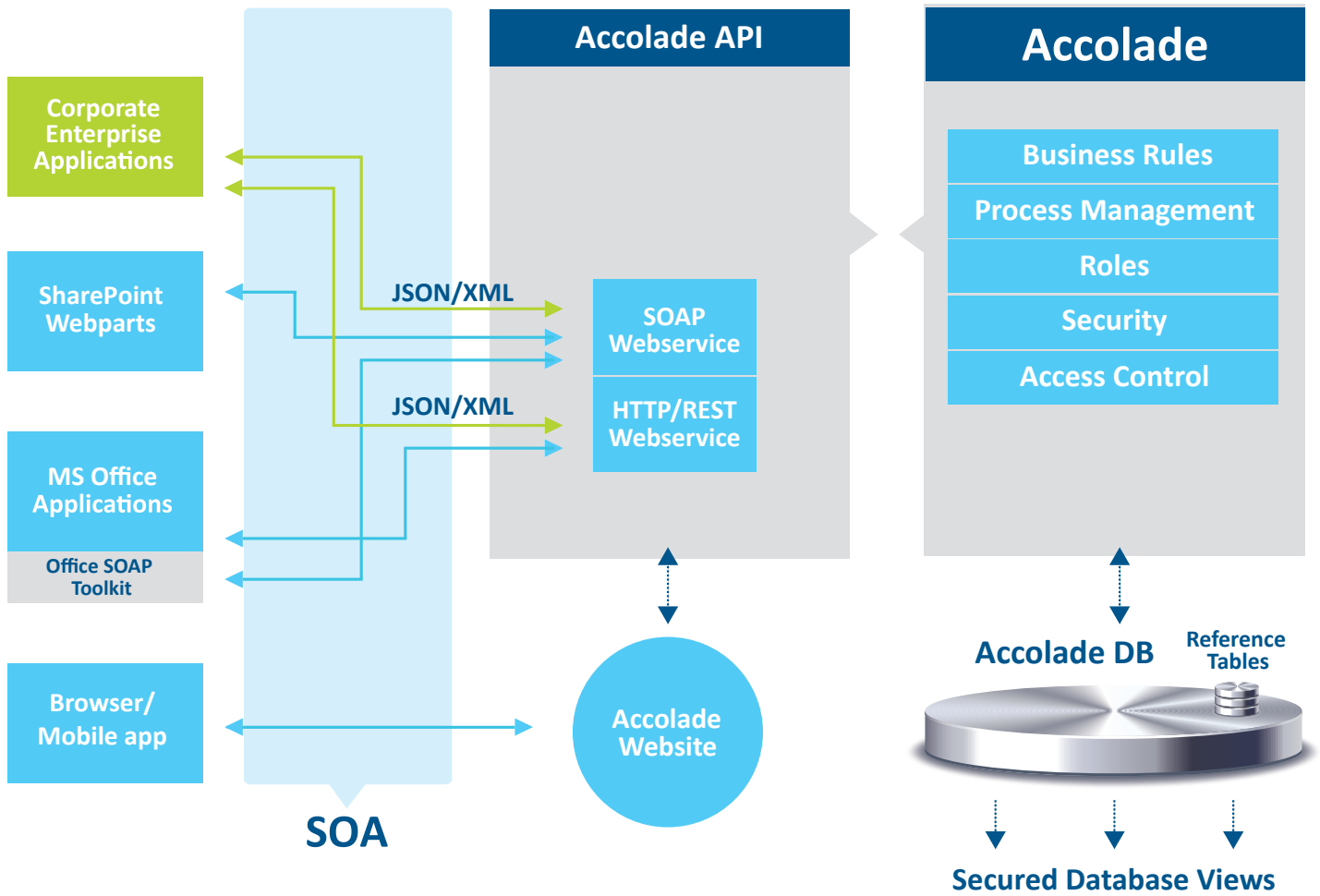


Figure 7: Schematic of the Accolade API.

Below is an example of JavaScript code that uses the Accolade REST/JSON API to write data to the console log for each of the projects on a particular user's My Gates page.

```
<script>
(function ($) {
  'use strict';

  var
    serverName = 'accolade.domain.com',
    apiBaseUrl = 'http://' + serverName + '/WebServices/Mobile.svc',
    username = 'DOMAIN\\Jane Doe',
    password = 'secret123';

  getMyGates()
    .then(function (projectReferences) {
      var projectIDs = $.map(projectReferences, function (projectReference) { return projectReference.ID; });

      getProjects(projectIDs)
        .then(function (projects) {
          $.each(projects, function (index, project) {
            console.log(project);
          });
        });
    });

  function getMyGates() {
    return $.ajax({
      type: 'GET',
      dataType: 'json',
      url: apiBaseUrl + '/MyGates?includeThumbnail=false',
      username: username,
      password: password
    });
  }

  function getProjects(projectIDs) {
    return $.ajax({
      type: 'GET',
      dataType: 'json',
      url: apiBaseUrl + '/Project/' + projectIDs.join(',') + '',
      username: username,
      password: password
    });
  }
})(window.jQuery);
</script>
```

Figure 8: Sample API code.

How Sopheon Can Help

Since the solution was first launched in 2001, Sopheon's solutions have been successfully integrated with a variety of third-party systems, enabling our customers to incorporate relevant data from other corporate processes into the product innovation process. Sopheon's expert implementation team can support you in defining, configuring, and integrating your third-party system with our Accolade solution set. The result will be a single source of truth for more effective product development and portfolio decision-making, ensuring that you derive the maximum value from the use of our software. Contact us at info@sopheon.com to learn more.



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