Traditionally, laboratories have operated autonomously from the rest of the organization. However, organizations have realized the need to extend laboratory data outside of the laboratory environment into enterprise-wide operational processes in order to enhance productivity and efficiency.

Laboratory Information Management Solutions (LIMS) can provide vital information to Enterprise Resource Planning (ERP) systems, especially the quality/process control systems of ERP, such as quality management and materials management. Such exchange of information can help ensure that product quality matches external regulations and internal standards. Moreover, LIMS can identify raw materials needed for testing and provide real-time data for ongoing adjustments to the production process. In addition, organizations’ timely recall efforts are hindered without seamless traceability from LIMS and ERP systems.

Ad-hoc integration of LIMS and ERP can tremendously increase maintenance costs and reduce the productivity of both systems and the integration itself. Effective integration of an organization’s LIMS and ERP systems in a single, cohesive information technology (IT) environment can offer significant operational benefits. Companies are able to streamline the overall operational process, speed product release, ease traceability, reduce total cost of ownership, and more easily and quickly respond to changing business environments.

LABVANTAGE ENTERPRISE CONNECTOR™-CERTIFIED FOR SAP NETWEAVER™

With LABVANTAGE Enterprise Connector™ (SEC) certified by SAP, LABVANTAGE was the first LIMS achieving “Powered by SAP NetWeaver” status. SEC is an embedded component of LABVANTAGE that facilitates tailored bi-directional data flow between LABVANTAGE and SAP. SEC enables end-to-end process integration, an IT practice that allows disparate applications and business partners’ systems to exchange information and execute transactions smoothly, operating as if they were a single system.

SEC enables LABVANTAGE to be implemented at various stages of quality/materials management process within SAP. It helps businesses better manage the delivery of materials and ensure compliance with regulatory standards.
and quality of products by taking prompt action to accommodate and respond to unpredicted issues.

By integrating a variety of processes in a configurable fashion, SEC helps businesses achieve their objectives through providing real-time data access for decision-makers with enriched, actionable information. It allows businesses to gain a number of advantages, such as:

- Accelerating time-to-market of products and services,
- Maintaining data integrity and reducing data redundancies across multiple systems,
- Facilitating data transfer and knowledge sharing throughout the enterprise,
- Decreasing the cost of ownership for system maintenance and upgrades,
- Increasing operating productivity between the laboratory, manufacturing, and the corporate enterprise, and
- Enhancing overall competitiveness through improved collaboration and information management.

SAP® OVERVIEW (CONT’D)
SAP NETWEAVER™
As the leading provider of Enterprise Resources Planning Systems (ERP), SAP ERP is chosen by many enterprises to serve as their fundamental information management infrastructure for facilitating enterprise-wide information sharing and sustaining their business competitiveness.

SAP NetWeaver™ is an open integration and application platform allowing Information Technology (IT) to be an agent of transformation as it aligns IT with enterprises’ business objectives. With SAP NetWeaver, companies can deploy a services-oriented architecture and obtain more business value from existing IT investments.

SAP NetWeaver is considered the best way to integrate SAP and non-SAP solutions. Because SAP NetWeaver supports both present as well as future SAP and non-SAP solutions, the platform is the center of a growing ecosystem of applications and services. Companies’ current applications will become even more valuable over time as they take full advantage of new products and enhancements as they become available.

SAP NetWeaver is the foundation for Enterprise Services Architecture, the SAP blueprint for services-based, enterprise-scale business solutions that offer the increased levels of adaptability, flexibility, and openness required to reduce total cost of ownership (TCO).

Source: www.sap.com

Figure 1: Example of a Configured LABVANTAGE Tramline – SAP Message Type
The integration of SAP ERP and LABVANTAGE enables the update of data in both systems on a real time basis. SEC interfaces with SAP NetWeaver to enable the integration of LABVANTAGE with most versions of SAP R/3 and SAP ERP, including:

- SAP R/3 4.0B,
- SAP R/3 4.6B,
- SAP R/3 4.6C,
- SAP R/3 4.7, and
- All versions of SAP containing the SAP ERP Central Component (ECC) v.5.0 or v.6.0.

SEC seamlessly connects to SAP to control and maintain communication flow by triggering functional mapping.

**KEY FUNCTIONAL FEATURES***:

**Bi-directional Communication:**
- Identify the direction of messages (incoming or outgoing)
- Parse and interpret incoming messages, as well as, generate outgoing messages (both in SEC.xsd format)
- Enable synchronous (file-less) or asynchronous (file-based) data transfer
  - File-less: Synchronous data transfer via LABVANTAGE Web Services
  - File-based: Asynchronous data transfer using shared folders
- Map the messages exchanged between SAP and LABVANTAGE through configuration
- Route message processing/handling to LABVANTAGE Actions

**Message Tracking:**
- Track both incoming and outgoing messages and associated information
  - Process and send status
  - Process and send date
  - User information
- Allow the system administrator to turn on/turn off message tracking

**Error Handling:**
- Identify failed messages
- Determine the cause of a failure/an error
- Reprocess failed messages
- Resend failed messages

**PRE-CONFIGURED MESSAGES CERTIFIED BY SAP***:
The following pre-configured scenarios are certified by SAP. Message exchange scenarios are not limited to the ones described below.

**Outbound from SAP and inbound to LABVANTAGE:**
- Material creation
  - Material data created in SAP is correspondingly created in LABVANTAGE

*Note: Separate configuration of SAP NetWeaver, SAP applications, and LABVANTAGE are required.
Outbound from LABVANTAGE and inbound to SAP

- Material update/change
  - Material data updates/changes made in SAP automatically update the material properties in LABVANTAGE
- Inspection lot creation
  - Creation of inspection lot in SAP produces samples associated with that inspection lot in LABVANTAGE
- Inspection lot update
  - Changes of inspection lot in SAP update sample details associated with that inspection lot in LABVANTAGE
- Master Information Characteristics (MICs) creation
  - MICs created in SAP produce parameter lists in LABVANTAGE

QUALITY CONTROL PROCESS

SEC provides the ability to automatically log samples into LABVANTAGE based upon the generation of inspection lot in SAP, allowing laboratory analysts to work in LABVANTAGE to schedule testing, perform testing, and record test results. After review and approval of the test results, the results are automatically transmitted back to SAP, where appropriate usage decisions are made.

The basic functional purpose of SEC for the quality control process is to:

*Note: Message exchange scenarios are not limited to the ones above.*
- Associate LABVANTAGE sample data with SAP QM inspection lot operations;
  - Whenever a user creates and/or updates an inspection lot in SAP, the sample data is generated in LABVANTAGE.
- SAP sends the material master data to LABVANTAGE.
- Update LABVANTAGE parameter list and specification limits via MICs in SAP QM;
- Transmit test result data from LABVANTAGE to SAP;
- Copy sample data from LABVANTAGE to SAP QM; and
- Allow SAP to receive data regarding test results for usage decision.

When a test is initiated by an inspection lot in SAP QM, the corresponding sample data will be created automatically in LABVANTAGE. In other words, once the inspection lot is generated, the testing process begins.

After the lab completes the lot inspection, SAP QM makes accept/reject determinations for the individual characteristics, and ultimately makes a usage decision for that material/sample. In response to the usage decision, SAP QM might issue a quality certificate for a customer, hold a shipment, disqualify a raw materials supplier, or tighten/loosen future inspections for a supplier’s shipments.

Behind-the-scenes, SAP QM has extensive decision processes to plan inspections and coordinate inspections with activities associated with procurement, sales, warehousing, and manufacturing groups. These processes generate the inspection lots that LABVANTAGE downloads from SAP QM; however, those lots are invisible in LABVANTAGE.
PROCUREMENT PROCESS
SEC manages transferring of indents that create purchase requisitions raised in LABVANTAGE to SAP MM. The corresponding data on materials received in SAP are transferred to LABVANTAGE when issued to the laboratory. Procurement-related business processes are executed in SAP, and lab processes are handled in LABVANTAGE.

- Start the procurement processes with purchase requisition; and
  - PRs are created in SAP based on the indent raised in LABVANTAGE.
  - Purchase orders (POs) are generated with respect to purchase requisition in SAP and are subjected to release procedure.
- Check materials availability in stock.
  - If materials are available, they are issued to the lab, and inventory data is automatically updated in LABVANTAGE.
LABVANTAGE OVERVIEW

LABVANTAGE Solutions, Inc. is an innovative global provider of enterprise solutions tailored for leading laboratories. We serve numerous laboratories focused on:

- Research & Discovery
- Development (including Life Sciences Pre-clinical & Clinical Development)
- Formulation & Process Research
- Raw Material Testing
- Quality Management

Our global customer base encompasses companies across multiple industries including:

- Pharmaceutical & Biosciences
- Health & Personal Care
- Food & Beverage
- Process Chemicals
- Petrochemicals
- Parts, Hardware & Equipment
- Law Enforcement & National Security
- Contract Services

LABVANTAGE is a thin-client Laboratory Information Management Solution (LIMS) tailored to manage an organization’s critical laboratory information across its worldwide R&D pipeline and manufacturing supply chain in order to optimize productivity and more effectively share knowledge.

Headquartered in Somerset, New Jersey, United States, LABVANTAGE also has offices in High Wycombe, United Kingdom and Kolkata, India, and utilizes a strategic network of global business partners to provide regional sales and customer support.

LABVANTAGE is a privately held affiliate of The Chatterjee Management Group Company, a $1.5 billion private investment group that invests globally in infrastructure, communications and information technology companies.