

Case Study - Requirements Management for Honeywell



KOVAIR

By Kovair Marketing

US Corporate Office

Kovair Software, Inc.
2603 Camino Ramon,
STE 200, San Ramon,
CA 94583, United States
Tel: 1.408.262.0200 Extn.1
Email: sales@kovair.com

India Registered Office

Kovair Software Pvt. Ltd.
PTI Building, 6th Floor, DP-9,
Sector – V, Salt Lake City,
Kolkata - 700091, India
Tel: 91-33-4065 7016/17/18/19
Email: sales@kovair.com

Bangalore Office

Kovair Software Pvt. Ltd.
Samad House, #402, 4th B cross,
7th A Main, HRBR Layout, Kalyan
Nagar, Bangalore- 560043, India
Tel: +91-95350 92589
Email: sales@kovair.com

Table of Contents

Introduction	3
Business Scenario.....	3
Challenges.....	3
Solution.....	4
Kovair Application Lifecycle Management Solution	4
Solution implemented at Honeywell.....	5
Entities Defined for Honeywell’s Application Lifecycle Management Solution.....	5
Integration with other tools using Omnibus.....	6
Users and Access Management.....	7
Importing Requirements from Word Document.....	8
Complete Traceability between Various Entities of Application Lifecycle Phases.....	8
Requirement Review, Approval, Baseline, Implementation and Testing Process.....	9
Generating System Documentation in Microsoft Word Formats	10
Results.....	11
Conclusion.....	11
About Kovair.....	12

Introduction

Honeywell Technology Solutions Lab (HTSL) is an integral research, development and engineering arm of Honeywell. It provides value to Honeywell's businesses and customers through technology, product and business solutions that meet global standards of quality, innovation and lifetime performance.

Employing diverse engineering skills, along with program management, quality assurance, systems engineering, technology and market analytics, HTSL provides business oriented total solutions to Honeywell's businesses in the areas of Aerospace, Automation and Control Solutions, Specialty Materials and Transportation Systems.

HTSL has its headquarters in Bangalore and centers in Shanghai, Beijing, Brno, Hyderabad, and Madurai. It is one of the larger R&D outfits established by multi-national corporations in India.

HTSL is a SEI CMMI Level 5 company, and has also attained PCMM Level 5 maturity.

Business Scenario

At HTSL, the various groups, such as Requirement Writers, Development, QA and Project Management teams were working independently in separate silos and it was difficult to track the current status of the implementation of the requirements. Hence, a system was required wherein one could see the details of the requirements and their relationships with other artifacts.

HTSL required an application that could be used by the groups to manage the requirements, test cases, design elements, and defects. The Requirement Writers would create the requirements. These requirements would then be reviewed approved by peers and Customers. Once approved, the

Development Team would implement these requirements. The development builds would then be checked into Subversion or ClearCase. The file contents of the SVN/CC files would be made available on demand through federation architecture. The QA team would generate the test cases based on the requirements. Once the test cases are executed, the defects generated would flow into JIRA.

Challenges

The major challenge for HTSL was managing requirements. Requirements, if not managed correctly can lead to high-level of rework throughout the project lifecycle, and team-members also get tired of redoing the work because of requirements getting changed frequently. Besides, there is always a "question mark" on whether the product meets the approved requirements.

Requirement Management and Development is a very important lifecycle phase, which helps in bringing all stakeholders — customers, architects, analysts, developers, testers and other team-

members - in sync with respect to "Real Requirements". This in turn minimizes the scope of rework and reduces risk of delay in project completion and cost overrun.

Solution

Kovair Application Lifecycle Management Solution

Kovair Application Lifecycle Management Solution provides a rich and configurable, global platform for implementing Software Development Life Cycle (SDLC) process, collaborating on the entire development cycle and tracing implementations back to original requirements.

Kovair Application Lifecycle Management Solution ensures that all the stake-holders and team-members are working on the same work area, no matter where they are located, and that there are no costly last minute surprises. As a result, it is rated as a top-quality application that matches Honeywell's requirements and complies with their internal and external-Requirements-Management.

The main features of Kovair Application Lifecycle Management Solution are:

- ❖ 100% Web based for global access without any client side software.
- ❖ Multiple ALM Solutions (Requirements, System Architecture, Design Elements, Tests, Defects and Change Requests) in a single data repository.
- ❖ Achieve Change Management with multi-level traceability
- ❖ Built-in Workflow Process and Policy Engines for reviews and escalations.
- ❖ Document Management and Attachment capabilities for global review and approval of documents.
- ❖ Microsoft Word Import Add-on to facilitate importing requirements from Microsoft Word documents. This add-on helps in creating comprehensive real-time Word reports, such as SRS, BRD etc.
- ❖ Excellent Reporting capabilities with Dashboards, Word, Excel and Crystal Reports.
- ❖ SOA based Enterprise Service Bus ("Omnibus") integrations with any best-of-breed third party tool for Integrated ALM Solutions.

Solution implemented at Honeywell

Entities Defined for Honeywell's Application Lifecycle Management Solution

Kovair Application Lifecycle Management Solution was fully custom configured (codeless mouse-click configurations) to meet Honeywell's requirements, which included domain and safety specific challenges. The final Application Lifecycle Management Solution implemented at Honeywell consisted of the following entities or objects:

- ❖ Successful completion of a customized and complex use case scenario.
- ❖ Projects
- ❖ Requirements
- ❖ Design Elements
- ❖ Test Designs
- ❖ Test Sets
- ❖ Test Cases
- ❖ Test Steps
- ❖ Test Runs
- ❖ Defects

Integration with other tools using Omnibus

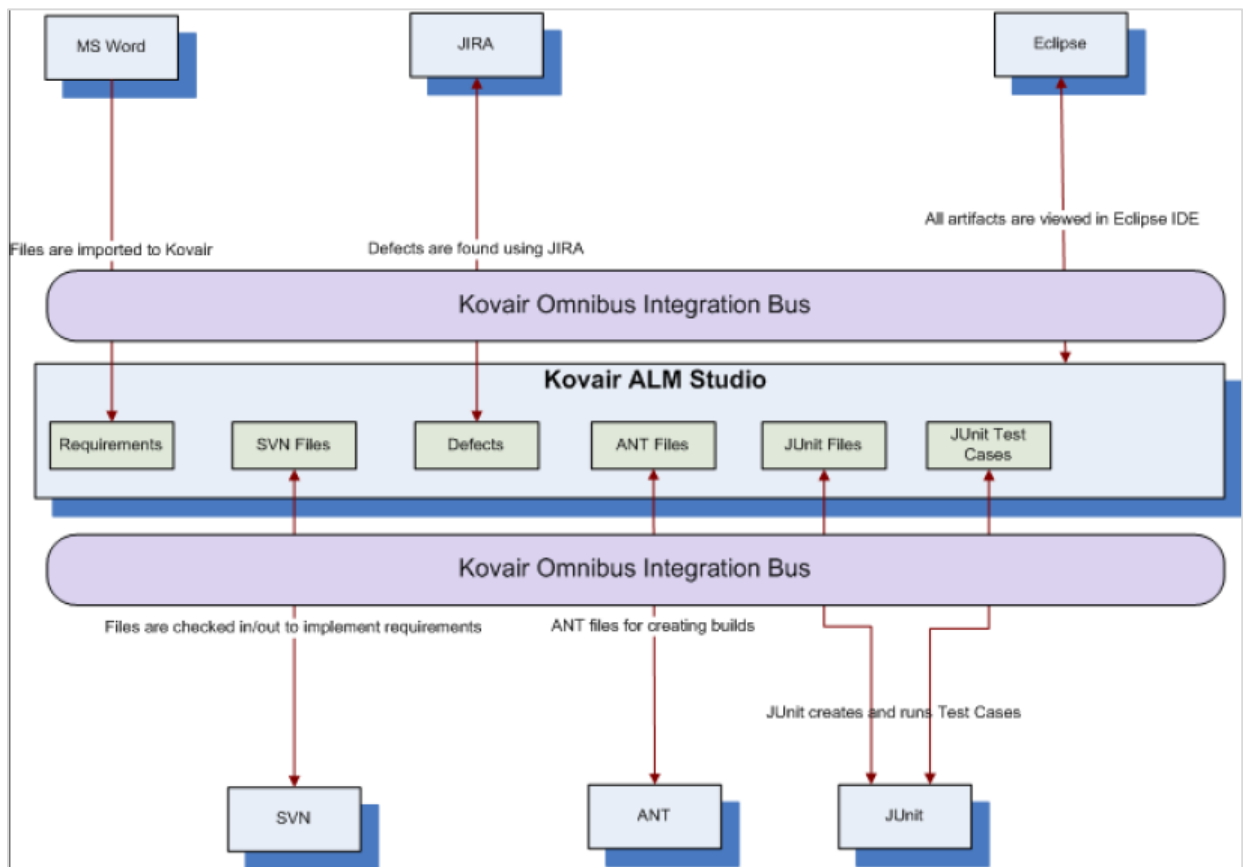


Fig: Tools Integration Diagram

As shown in the preceding diagram, SRS documents are imported into Kovair using Kovair's Word Import Add-On. While importing, the rich text of each item is preserved and Kovair's rich text editor allows these rich text items to be viewed and edited. The requirements are imported within the Requirements entity in Kovair.

To implement the requirements, the developers need to check-in/check-out files in SVN. SVN files are not duplicated in Kovair Omnibus; file contents are made available on demand through federation architecture. The Change sets can be linked to any Requirement or Defect item in Kovair. This allows tracing Requirements to the actual source files or Defects to the fixes in the code files. Change sets can follow a Review and Approval Process defined in Kovair.

After the requirements are implemented, the Testers report the defects in JIRA and the defects are populated in Kovair under the Defects entity through the Kovair Omnibus.

The ANT adapter allows you to add ANT Build files directly from the ANT window of the IDE.

The JUnit adapter allows you to add the JUNIT Test Cases/ JUNIT Files directly from the code editor of the IDE.

The Eclipse Plug-in for the Kovair Omnibus allows Eclipse developers to access Kovair functionality directly from within their familiar IDE environment. Communication with all the above-mentioned third party tools takes place using Kovair Omnibus Integration bus.

Users and Access Management

Kovair's comprehensive Users and Access Management mechanism helped in achieving Honeywell's security concern of sharing the requirements and other information strictly on a need-to-know and authorization basis. A Developer working on a requirement of a project was allowed to access only that requirement. Similarly creating, viewing and/or modifying records of entities, such as Projects, Requirements, Test Cases were allowed by authorized personnel only.

Kovair helped in creating User Access Groups with required access rights and privileges based on Honeywell's requirements. With this, all users assigned to Access Groups, automatically inherited the privileges of their specific Access Group.

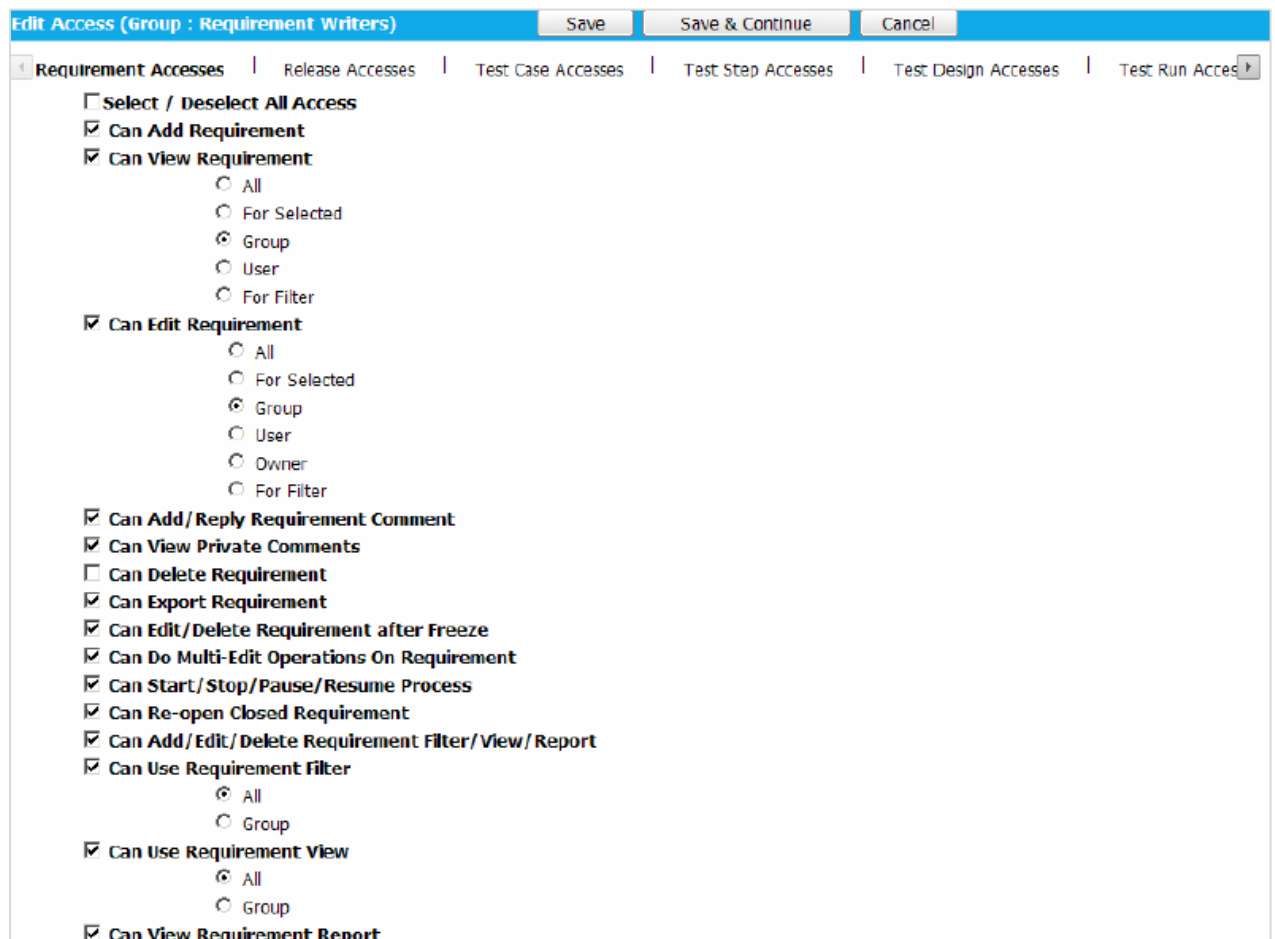


Fig: Access Group Management

Importing Requirements from Word Document

At HTSL, the requirements were collected mostly in the form of Microsoft Word documents, and were classified as:

- ❖ External Interface Requirements
- ❖ User Interface Requirements
- ❖ Hardware Interface Requirements
- ❖ Software Interface Requirements
- ❖ Communication Requirements
- ❖ Functional Requirements

HTSL wanted to have a functionality to automatically import requirements from Word documents into Kovair. Kovair, with its Microsoft Word Import Add-on functionality, imported requirements directly from the Microsoft Word documents. The Word documents were parsed on the basis of requirement types assigned to different tables, and the requirements were imported into Kovair Requirements Management Solution.

Complete Traceability between Various Entities of Application Lifecycle Phases

Kovair's comprehensive Traceability Relationship functionality helped in implementation of complex relationships between various entities/objects pertaining to Application Lifecycle phases. This functionality helped in implementing Requirements Impact mechanism, which started from directly linked items and traversed till the root item.

The screenshot displays a 'Requirements Traceability View' in the Kovair system. It shows a hierarchical relationship between various entities of the application lifecycle phases. The main view is for 'Business Requirement to Defect' with 48 items. The selected item is 'Updating Profile Info' (ID: 48), which is a 'Business Requirement'. Below it, the traceability path is shown:

- Use Case(Business Requirement to Use Case)**: 'Use Case for Managing User Profile' (ID: 2)
- Functional Requirement(Use Case to Functional Requirement)**: 'Data providers should be able to return to the web' (ID: 16)
- Test Case(Functional Requirement to Test Case)**: 'TC for Designing of Home Page' (ID: 22)
- Test Run(Test Run to Test Case)**: 'TC for Designing of Home Page - (Test Case) - Rur TC for Designing of' (ID: 35)
- Defect(Test Run to Defect)**: (ID: 35)

The table below summarizes the data visible in the screenshot:

Entity Type	ID	Title	Reviewer	Submitter	Submit Date	Priority	Review Statistics	Submission Date
Business Requirement	48	Updating Profile Info		Sam Manager	12/02/2013 03:36	High	Approved - 2 (100.00%)	
Use Case	2	Use Case for Managing User Profile		Sam Manager	12/26/2013 14:30			
Functional Requirement	16	Data providers should be able to return to the web	Tony Reviewer,Sar	Sam Manaj	12/24/2013 15:09			
Test Case	23	TC for checking specific Functionalities pertaining		Sam Manaj	12/11/2013	Failed		
Test Case	22	TC for Designing of Home Page		Sam Manaj	12/12/2013	Failed	Failed - 1 (100.00%)	
Test Run	35	TC for Designing of Home Page - (Test Case) - Rur TC for Designing of		Sam Manaj	12/12/2013	Failed - 1 (50.00%)	Failed	Failed

Fig: Requirements Traceability View

Requirement Review, Approval, Baseline, Implementation and Testing Process

Workflow Diagram

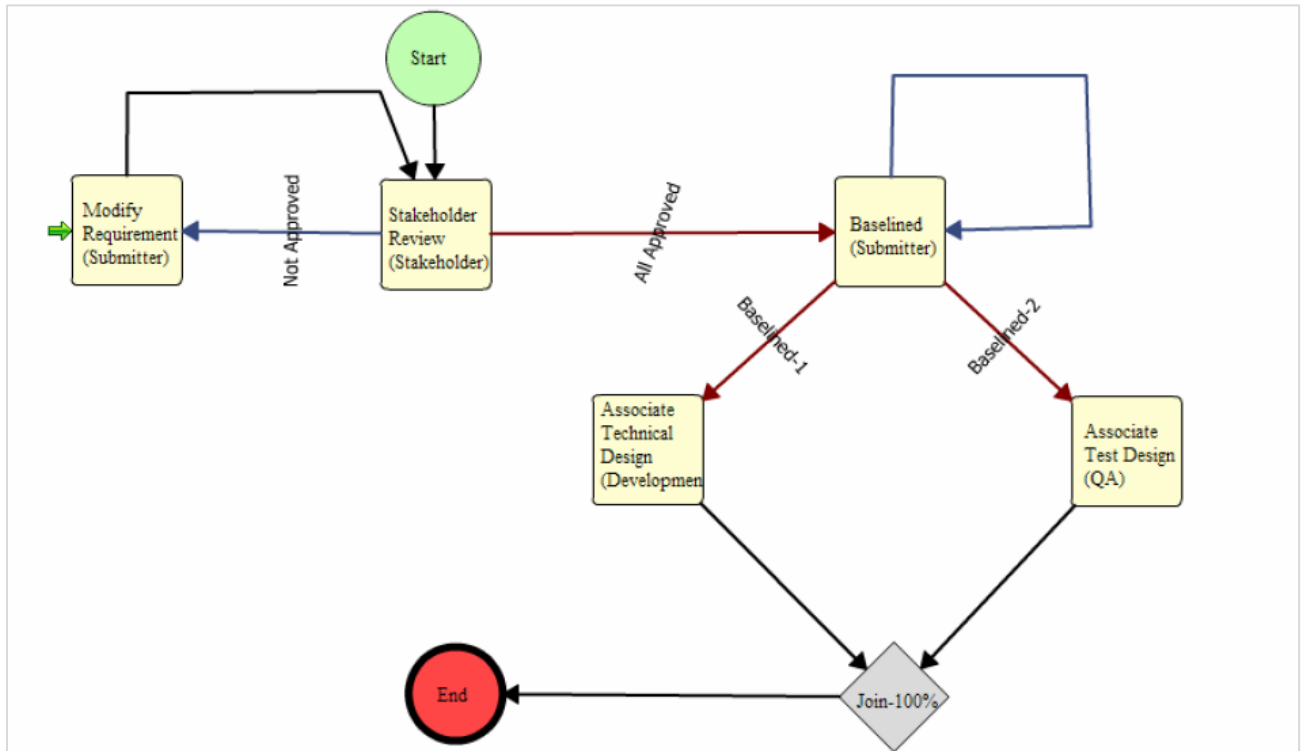


Fig: Process flow that has been implemented

Kovair Application Lifecycle Management Solution implemented Honeywell's "Review, Approval, Baseline, Technical Design, Test Design, Implementation and Testing" processes using the Kovair Process Workflow and Policy engine.

As per this process, whenever a requirement is entered into the Kovair Application Lifecycle Management Solution, the status of the record is marked as "Submitted". The requirements are fed into the system by the Business Analyst team. Kovair Process workflow automatically starts the "Review" process. The Review Tasks are generated for all the Stakeholders. The process workflow ensures that all Stakeholders review the requirements individually and give their views on the requirements. When all Stakeholders "Approve" the requirements, the Status fields of the Requirements is changed to "Approved" and the review process is marked as cleared for the next step. If any of the Stakeholders does not approve the requirement then a task is generated for the Owner of that requirement and the status is changed to "Submitted" so that the Owner can modify the requirement based on Reviewer's comment. Once the requirement is approved by all the Stakeholders, a task is generated for the Owner of that requirement to baseline the requirement. Once the requirement is base-lined, the approved document is placed in Subversion. Thereafter, two parallel tasks are created for the Development team and QA team. The Development team develops the

technical specifications and links with the requirement. The QA team works on the test design, creates the test cases, and relates them to the requirement. Once the review process is cleared by the QA team, the approved test document is placed into Subversion. Similarly, once the technical specifications are developed, the code is developed and checked into Subversion.

The test cases are executed in Kovair using the Kovair Test Management solution using the following entities: Test Case, Test Step, Test Run, and Test Set.

When a test case is executed, a new Test Run form appears. The test steps appear in the Executed Steps section of the Test Run form. The Tester then enters the status of the Test Steps and saves the Test Run. Defects are generated for the failed test steps and these defects flow into JIRA.

The Test Case record execution details get populated properly for the corresponding test case.

The screenshot displays the 'View Test Case' window with the following data:

General Information						
Title	Test case 4					
Priority	Author: BalajBhardwaj					
Activity	Submit Date: 07/07/2011 00:47					
Description	Test case 4					

Execution Details						
Execution Date	07/07/2011 01:16		Executed By: BalajBhardwaj			
Execution Status	Failed		Test Case Coverage: Failed - 1 (50.00%), Passed - 1 (50.00%)			

Related Steps						
ID	Title	Submitter	Submit Date	Version	Relation Comment	
5	Test step 1	Balaji Bhardwaj	07/07/2011 00:48	1		
5	Test step 2	Balaji Bhardwaj	07/07/2011 00:49	1		

Test Run						
ID	Title	Total Steps	Execution Date	Execution Status	Test Run Coverage	Relation Comment
16	Test case 4 (TC) - Run On - 07/07/2011 03:19:00	2	07/07/2011 03:49	Passed	Passed - 2 (100.00%)	
18	Test case 4 (TC) - Run On - 07/07/2011 03:46:00	2	07/07/2011 01:16	Failed	Passed - 1 (50.00%), Warning - 1 (50.00%)	

Fig: Test Case Execution Details

Generating System Documentation in Microsoft Word Formats

Honeywell's requirement of generating the BRD/SRS documents as per their standard Word templates was implemented using Kovair's Word Report Add-on. Kovair Word Report Add-on is a plug-in component for Microsoft Word. Microsoft Word templates for the documents required by Honeywell were created as part of the implementation and configuration of the solution. These templates were then uploaded in the Kovair Application Lifecycle Management Solution.

On execution, these templates extracted real-time data from database and generated word reports as per Honeywell's organization standard.



Fig: Kovair Word Report Template Interface

Results

As mentioned above, the implementation of a Requirement Management solution was required in HTSL because earlier the requirements were documented, managed and traced through Word documents, and it not only had the risk of wrong implementation of requirements, but loss in productivity as well.

With the implementation of the solution, HTSL was able to reduce the rework done due to incorrect requirements and was able to speed up the development as the entire process was automated with

Kovair Omniprocess Workflow Engine. With this implementation, the productivity was improved by about 20% and requirements related defects were reduced by at least 10%. These are significant improvements.

Conclusion

Honeywell has achieved all their goals of Requirements Management for the REM and HTS projects by implementing Kovair Application Lifecycle Management Solution – the ALM Studio in their organization, and are very pleased with the outcome.

About Kovair

Kovair Software is a Silicon Valley based software product company specializing in the domain of Integrated Application Lifecycle Management (ALM) solutions and supports global software development and management. Kovair's focus on integrating third party best-of-breed ALM tools enables creation of applications in a synchronized tools environment.

Kovair has partnered with leading technology brands like Microsoft, IBM, CA, BMC and more to provide customers a wide range of integration solutions.

Product Portfolio: Kovair's flagship products **Omnibus Integration Platform**, **ALM Studio**, **QuickSync** and **Integrated DevOps** are highly preferred solutions by some of the major corporations globally.

Recognitions: The **SD Times 100** has recognized Kovair as one of the top 100 software innovators in the domain of Application Lifecycle Management. Kovair's Innovations in ALM Tools and ALM Integrations are well recognized both in the industry and by analysts at places like **Gartner** and **Forrester**.

Business Focus: Application Lifecycle Management Products and Services, Integration Platform

Industry Verticals: IT Consulting and Services, Banking and Financial Services, Telecom, Manufacturing, Networking, Healthcare, Defense and Government.

Contact: For more information about product and services contact sales@kovair.com. You may follow Kovair updates on [Facebook](#), [LinkedIn](#), [Twitter](#), [Google+](#), [Slideshare](#) and [YouTube](#).

Important Links: [Why Kovair](#) | [Management](#) | [Product Updates](#) | [Tool Integrations](#) | [Product Brochure](#) | [Videos](#) | [Datasheets](#) | [White Papers](#) | [Case Study](#) | [Technical Documents](#) | [Presentations](#) | [Services](#) | [Blog](#) | [Press Releases](#) | [Events](#) | [Customers](#) | [Partners](#) | [Support](#) | [Contact](#) | [Site Map](#)

Global Technology Partners



Memberships and Associations

