

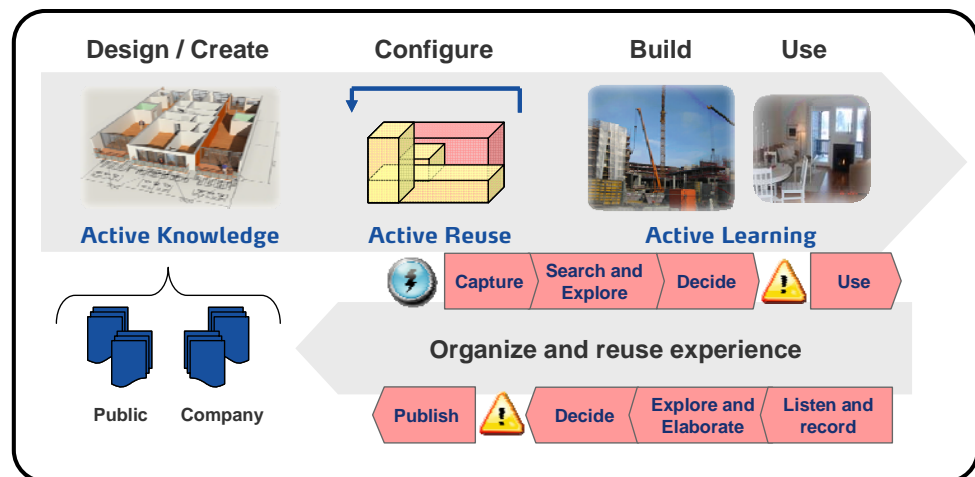
Bluethink® Experience Technical White Paper



***Experience** collects the individual experiences gained on-site in construction projects for evaluation and distribution as corporate knowledge. This enables constant improvement of quality in standard products and future projects. **Experience** supports both the in-house development process for house product development and collection of experiences in the on-site production process. **Experience** structure and define the design rules. These rules may be based on central or local rules and regulations, corporate purchasing rules as well as own experiences and best practices. Experiences and issues registered during construction may be registered directly in the system with a mobile PDA. Results from inspections performed during construction are stored in the central repository and easily available for reporting and analysis.*

In difference to general knowledge management, search and collaboration systems, **Experience** focuses on the process of qualifying and expressing formal knowledge elements of the organization which makes the basis for implementation in company procedures, control systems and various computer-based support systems. Available on the company's intranet, any company employee may use **Experience** to capture experiences, submit issues or suggestions as they see fit. Different forms are available for different issue types depending on typical information needed to describe the different knowledge elements. Issues are collected in a database. The analysis process includes roles and resources in workflows for elaboration and clarification of issues. When solutions are provided, and necessary detailed descriptions and classification are in place as required, the new knowledge elements may be authorized and closed. To support the knowledge process from collection to use, the application provides an environment where knowledge engineers can retrieve existing knowledge elements that are relevant to the issue at hand. The

Experience user may dynamically search in the existing knowledge repository by combining criteria from a number of category dimensions. Based on the findings, the process can complete, new knowledge can be added and existing knowledge can be reused.



To ensure proper use of knowledge, **Experience** also supports the quality control process. The quality control engineer can create control forms based on previous experience and knowledge to be applied at different control steps in the building process. The application supports the entry and administration of all individual forms according to the various building sections, work discipline, and other sorting criteria necessary. If a deviation is found when performing the control, the system automatically creates a new issue. The issue is then fed into Issue Handler for further analysis as an item of experience.

Functionality:

Experience Base module

The **Experience** Base module consists of an Experience Base framework. All modules for knowledge creation and capture, and the data connectors for data integration and tasks and alert management, connect to the Base module. Knowledge and experience elements originating from or processed in the different modules and connectors are stored in and easily available from the Experience repository.

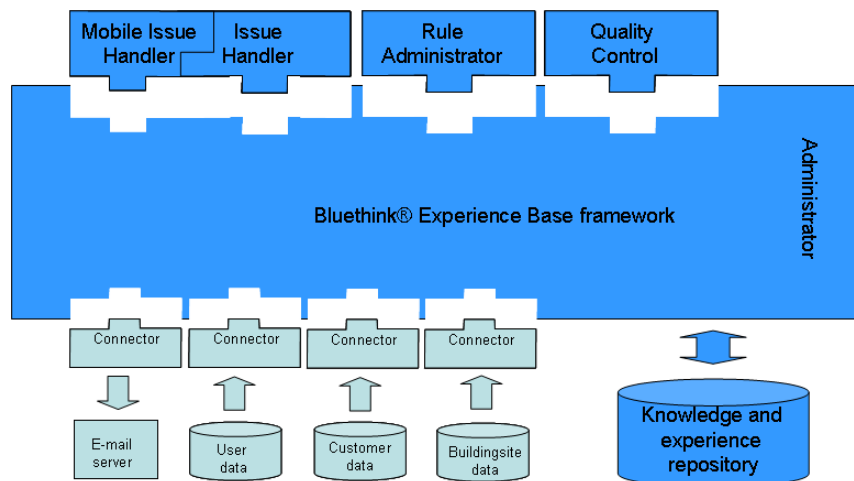


Figure 1: Experience Components

The **Experience** Base handles common data and structures, used by the various functionality modules in Experience. The Administrator module controls definition and maintenance of the domain specific data (like projects, building sites, buildings, disciplines and user-defined categorization). The framework also provides logging, auditing, security, scheduling, ETL, and web services.

Issue Handler

Issue Handler is an experience and knowledge management module developed for the construction industry. Issue Handlers focus is issue solving and knowledge growth.

Key features:

- Issue data registration
- Issue categorizing and documentation
- Search and reports
- Adaptable workflows
- Support of various Issue types like: Deviation, Technical Clarification, General Question, Change Request, Customer Request, Solution Matrix and Problem amplification.
- User roles like: Initiator, Contributor, Listener
- User defined categories
- Web based access
- Prioritizing and workflow management
- Statistics and analysis capabilities on both issues and issue handling process
- Email- based task and alert management.

Mobile Issue Handler

Our mobile application makes it possible to effectively register issues as they are discovered on the construction site directly into Issue Handler by using a mobile device.

Key features:

- Issue capturing by use of picture and voice recording
- Easy categorization and data registration
- Default user, and project information
- Synchronous and asynchronous transfer of data.
- Use of pre-defined values that simplify the registration
- Connection to Issue Handler for issue workflow.

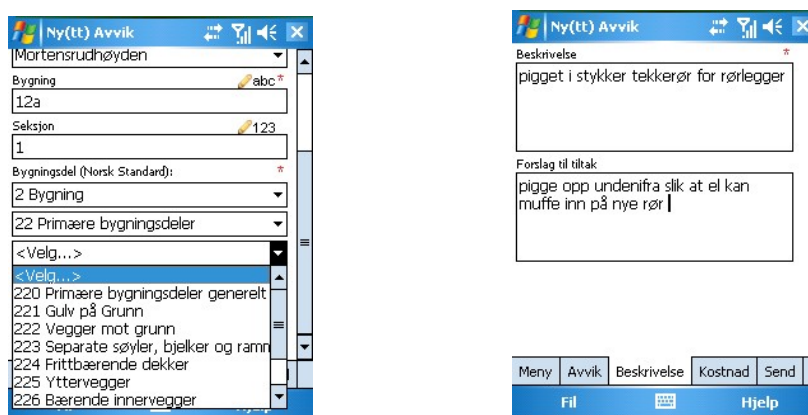


Figure 2: Mobile Issue Handler Screenshots

Rule Administrator

Bluethink Rule Administrator is a module for extracting and publishing of design rules from experiences and knowledge. The module supports detailed classification of the rule itself and the application of the rule.

Key Features:

- Rules are described, formalized and maintained in a simple yet effective web interface
- Rules are classified in an industry-specific and organization-specific taxonomy.
- Rules can be linked back to related issue items in Bluethink **Issue Handler** for background and context data.
- All the rules are versioned and changes are tracked
- Support for authorization and publishing of rules
- Powerful search capabilities
- Access to rule-search, rule-use and rule-documentation from external systems like Bluethink **House Designer**
- Email- based alert management

Quality Control

Bluethink Quality Control is a module for development and maintenance of corporate building site quality control standards and support of onsite control procedures and control status. The module combines building sections and work disciplines, and make sure that earlier experiences and knowledge gained is applied on future projects.



Key Features:

- Automatically establish control structure and procedures based on control templates and building information models.
- Easy to change and edit control templates
- Import building information from Bluethink Supervisor
- Quality Control status and reporting

Construction Project database connector

The connector enables reading building site data from any Microsoft SQL Server database, integrating Site, Building and Project data with other systems and databases within the company

Customer database connector

The connector enables reading customer data from any Microsoft SQL Server database, integrating Experience with your CRM (Customer Relation Management) or other customer service applications.

User administration and authentication connector (AD and LDAP)

Connector enabling authentication and user-data lookup from either Active Directory (AD) or Open LDAP server, ensuring that only authenticated users are allowed access and user roles through a single user administration system.

email connector

The connector integrates to any SMTP server, enabling email based task and alert management.

Key Benefits:

- Time to market improvement
- Design comply with embedded rules
- Reduced number of changes
- Productivity increase
- Reduced engineering time
- Reduced construction time
- Industrialized production
- Cost reduction
- Reduced warranty cost
- Reduced operation cost
- Continuous quality improvement
- Mandatory inspection reporting
- Improved quality control
- Error reduction
- Experience accumulation
- Corporate knowledge growth and reuse
- Individual experience is accumulated and available as corporate knowledge

Bluethink® Experience Technical White Paper



Related products:

- Bluethink® Supervisor
- Bluethink® House Designer

Related services:

- **Support:**
Technical Support gives our customers key personnel access to support engineers for assistance when technical issues occur, as well as software patches and product enhancements.
- **Training:**
Training of our customers super-users and end-users are provided, both as standard class room training, as well as bespoke training at the customer site.
- **Consulting:**
Installation and implementation services are important elements in Selvaag Bluethink's offering. The implementation services are based on the methodologies developed in parallel with the software products, ensuring the customer a best possible starting point for use of our products.

System requirements:

- Microsoft Windows 2000, XP or Server
- Internet Explorer Web browser.
- Microsoft SQL Server database. Must be licensed separately
- Standard J2EE applications running on any J2EE application server.
 - Verified on JBoss 4.0.5 Application Server.
- Microsoft Mobile 5.0 (Mobile Issue Handler device)
 - **Note:** 3rd Party Remote Mobile Asset Management must be licensed separately (for use with Mobile Issue Handler)



Active knowledge

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