
# Robust & reliable low code/no code (LCNC) platform, patented in the USA

# Introduction

Axpert is a robust and proven low code/no code (LCNC) platform that runs 1000+ applications by 750+ customers across 10+ countries. The solutions built on Axpert are used by more than hundred thousand users.

**Rapid development**: It enables developing and deploying applications with minimal or no coding. This enhances the operational efficiency of IT teams by more than 50% that directly results in rapid development and deployment of applications.

**Change management**: Axpert applications are developed only by defining the meta data and rules. This enables quick incorporation of policy changes, regulatory requirements, new compliance metrics, transfer of people and work flow changes. This enables addition of modules and business processes with ease.

**Empower domain consultants**: Domain consultants are better suited to understand user needs, conduct UAT and roll outs. Axpert empowers them with a configuration studio to customize the application during roll out. This reduces the dependency on high skilled development teams thereby speeding up implementation.

**Inbuilt Analytics**: The analytics feature that is packed with Axpert identifies and creates different data visualizations based on the implicit relationships get created when an Axpert application is created. These data visualizations can be fine tuned to suit need. Drill downs from the visualization layer to the transaction data provides immense value to users.

**Integration**: Axpert comes with an API layer that is used to plug in functionality of existing applications. This also enable seamless data exchange between applications thereby reducing redundancy and errors.

**Security and compliance**: Axpert is already deployed in multitude customer data centers both on cloud and on premise. Most of these applications are used for mission-critical needs. The security of Axpert applications were tested by many infrastructure teams and deployed the Axpert application only after it was found to be "safe to host"

**Access control**: Axpert comes with a comprehensive user management component. This enables users to control access to users to menu, forms, form elements, reports, and data. The data access control allows users to control which data set can be seen by whom.

**Analytics and reporting**: Axpert comes with its inbuilt reporting tools and innovative analytics tools. This enables users to visualize data in multiple dimensions that provide useful insights into trends that contributes to decision making.

**Handle high data volume**: Axpert is proven to handle high data volume in multitude customer sites. Many of these customers that handle high volume of data are in government, defense, and large corporations.

**Scaling to support large concurrent users**: As number of concurrent users increase, Axpert effectively manages concurrency using queues & background processing. The infra team are given tools to identify bottlenecks and add computing resources where needed.

**Develop, deploy, and support from anywhere anytime**: Axpert comes with an online developer studio and config studio. This lets users develop and deploy from anywhere by accessing through a web browser. Axpert seamlessly enables remote support.

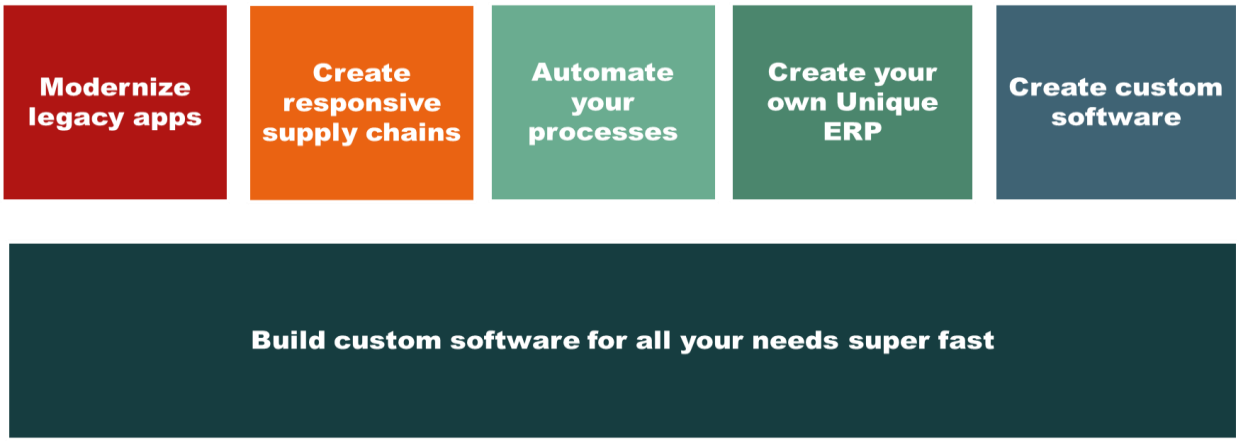
**AI Plugins**: Axpert lets users plugin software code written in any programming language to be plugged in. The plugins enable integration of various AI model for purposes like OCR, conversational AI and predictive analytics.

**UI Plugins**: Axpert lets users create their own UI using HTML and Java script and integrate into Axpert seamlessly. Users can create their own user experience and still benefit from the ease and power of Axpert.

**Data is your asset**: The data layer is open and stored in popular RDBMS. Users can choose to provide access of Axpert data for other applications. This lets users the exercise their choice of technology and applications for different business functions.

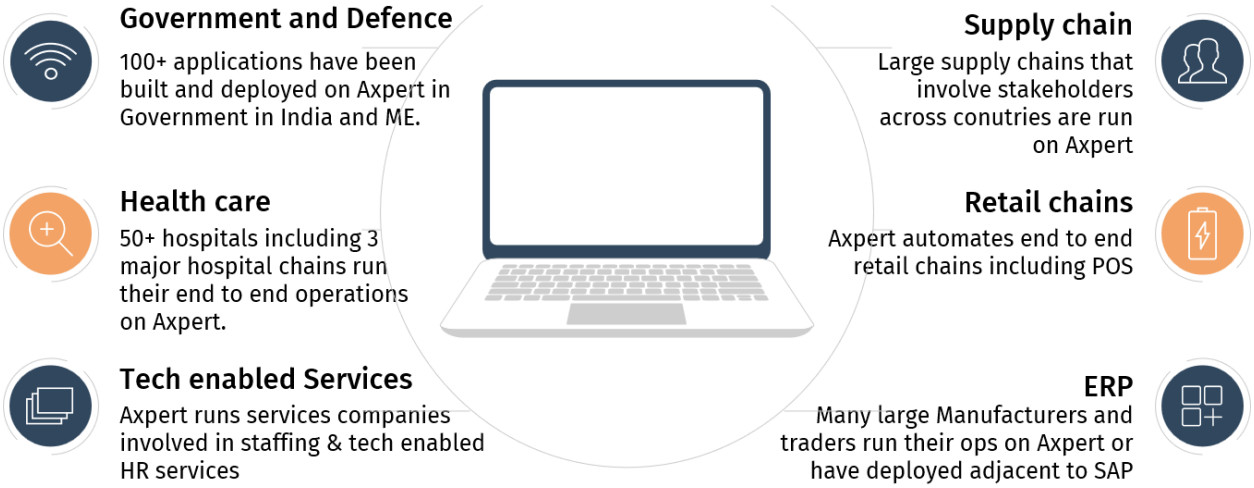
**Vendor independent**: All layers of Axpert are open. User has complete control to extend and modify any component in an Axpert application. Hence, user can choose service providers and tech platforms without any constraints.

## Possibilities with Axpert



Axpert Apps are created by only defining the data structures. There is no need to write programs in multiple layers. Agile owns the patent for this concept behind Axpert. Axpert is best suited for requirements that are data centrical with complex process, that needs to manage large volumes of data and integrate with other applications. Axpert is available both on-premise and on cloud.

## Domains and industries




Axpert is used in hospitals, manufacturers, traders, banks, contract farming companies, construction companies, pharmacies, Services companies, Startups, Tea manufacturing and distribution, Liquor manufactures & distributors, wealth managers, universities, staffing companies, BPO, payroll & HRMS providers.

## Value additions for Government

**Citizen services:** Axpert can be used to develop citizen centric applications like availing services online, grievance reporting, permits, apply for grants. This improves the accessibility of services to citizens and reduces the burden on government employees.

**High success rates**: Applications can be developed in an iterative model without comprehensive requirement specification document. This also helps government users to sign off on working prototypes instead of verbose documents. This reduces the probability of failures.

**Customization**: Work flow needs and rules constantly change in government. These changes are driven by policy changes, compliance changes or change of people. Axpert enables this effortlessly with its configuration studio.

**Crisis management**: An LCNC like Axpert can greatly enhance the speed of deploying software applications to manage at the time of crisis. One of the critical factors in managing a crisis is rapid data aggregation, visualization, changing work flows and

**Single platform across departments**: Axpert can be deployed as a single platform that can be used across departments for applications like ERP, file tracking, office automation, work flow automations & service delivery.

**Proven in government**: 100+ applications have already been developed and deployed using Axpert. It is used in service delivery platform, EoDB, Projects and schemes monitoring, disaster management, water resource management, health care, skill development, police, RERA and many more…

**Easy procurement**: As Axpert has already been procured by many government agencies and state governments, it is easier to procure through a single source tender from OEM and assign projects on Axpert.

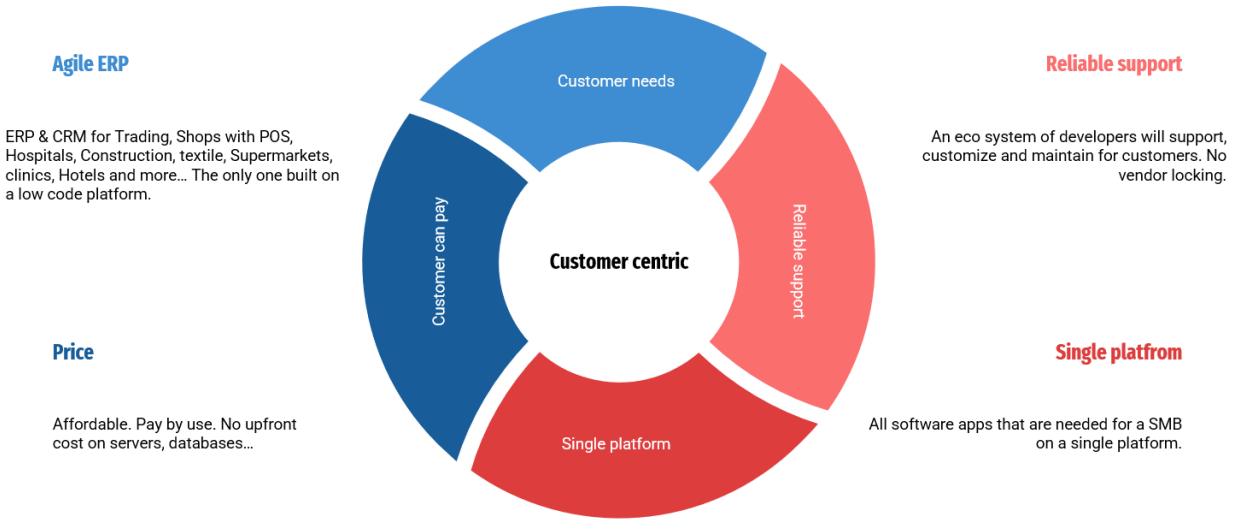
**Avoid application silos**: Most governments run multiple application for various needs that replicate same data. The applications also lack standardization. Axpert solves these issues elegantly through its effective integration stack through modern queues.

**People dependency**: Custom software development using traditional methods is always person or vendor dependent. Software developed on LCNC like Axpert, solves this problem by deskilling the application

development process, bringing in standardization and developing plugins to overcome limitations using any programming language.

Axpert presents a significant opportunity for government agencies to enhance their digital capabilities, improve efficiency, and deliver better services to citizens. By addressing the challenges and leveraging the benefits of the platform, governments can create a more responsive, efficient, and citizen-centric public sector.

## Value addition for SMB



## Value addition for large enterprises

**Reliable LCNC**: Axpert is already proven in many customer sites across domains for many mission critical needs. It is a safe choice to add LCNC capabilities to the organisation.

**Do more with smaller teams**: There is a huge demand for developers that leads to slowing down development activities. Axpert can add tremendous value in developing more applications with smaller teams. This is made possible as Axpert apps are developed without having to write too much of code.

**Reuse your team**: The existing IT team can be trained on Axpert to create modern mobile based applications and integrate them with your existing IT assets.

**Modernize**: Many applications that have been developed on older technologies need to be modernized. Custom developing them will involve huge effort and cost. Modernizing them using Axpert will be fast, safe, and cost effective.

**Reduce cost**: Axpert reduces the skill required to develop and support applications as it is a proven low code platform. Adding Axpert as your LCNC can reduce your IT spend by nearly 30%.

## Understanding the concept behind Axpert

The basic building block of Axpert is called a transaction structure. A **transaction structure (tstruct) is a collection of data elements along with business rules**. To develop apps on Axpert, the core entities are identified and represented as transaction structures.

A data element is described by its basic attributes (like type, width, etc..), rule to populate and rule to validate. A collection of such data elements become a structure. Data flow from one structure to another is created as maps. The maps are created by connecting data elements in source structure to the target structure. Special logic that needs to be attached along with data may be attached using Axpert scripts or database procedures and functions. Axpert support Oracle, MySQL, PostgreSql & MS SQL databases.

For example, in a CRM application, the core entities are prospects, sales person, customer master & daily activities. In a procure to pay cycle – supplier master, item master, rate contract, purchase request, purchase order, GRN, supplier bills are some of the major tstructs. In a time-sheet application – employee, project master, time sheet, sasks, project milestones are some major tstructs.

The structures are created in Axpert through the developer studio. The rest are managed by Axpert run time site. These structures can be accessed as a form in Axpert. In other words, all forms in Axpert are

created as tstructs. Once a structure is created, the underlying database tables to store data are automatically created. Axpert also manages all table relationships and referential integrities.

The Axpert core layer is a collection of API that provide services around a tstruct. It consists of API for saving data into structures, listing data from structures, searching, getting the menu, managing work flow, data flow, data import, data export, script execution, etc.

The Axpert UI layer provides a standard user interface for accessing tstructs as forms, lists, menus, widgets, wizards, data import & export features, user and access control management, work flow configuration.

Axpert is not a code generator. It has a standard set of APIs that read and execute the logic defined in structures. For example, there is one API called submit. This will be able to submit data into any structure or form.

Hence, functionalities created in Axpert are available as API that can be consumed by third party applications. There is no need to write programs or do any additional activity to publish the functionality as web (SOAP) or REST services.

## Main components in Axpert

Axpert comes with the following components to develop, deploy, run and support Axpert applications.

- run time environment
- developer studio
- configuration studio
- mobile app
- Axpert manager

The Axpert manager is a simple desktop tool to create and setup an Axpert Instance on premise.

## Run time environment

Users access Axpert application through the Axpert run time environment. This renders the forms, pages and reports that are created through the developer studio. It provides users with interface for listing, searching, import, export, send notifications, emails, navigations, reports, drill downs. The RTE ensures data security by controlling access based on the user access control.

The RTE manages **CRUD operations** in a form without the need to write code. This is an important feature because most of the time required in development and change management are spent on coding to perform

these operations. A form (structure) has the capability to manage the database transaction of any complexity without dependence on developer skills. The forms can provide an interface for accepting values in a tabular format too.

The forms provide options, without the need to write code, for listing the data entered in the forms, hyperlinks for loading the transaction data from the list. The lists are paginated automatically if the data volumes are high. The lists can be filtered on user defined conditions on the fly. They can also be sorted and grouped on the fly. The lists may also be exported to productivity tools like MS-Excel or saved in formats such as HTML, CSV, etc. The listing automatically brings connected data and enables smart navigation.

**Comprehensive search** option is available in the forms, to search on any field in the form, in any language.

Forms have the capability of being rendered in multiple languages simultaneously. The users will be able to enter data in the forms in **multiple languages** and the data is stored in Unicode.

Forms have the ability to track changes made in the edit mode. The changes could be tracked based on user, date and time and a **comprehensive audit trial** is available. Further, the audit trial may be used to track changes made by only a defined set of users or for user defined set of fields.

Forms have the capability of attaching one or more documents along with every transaction. The **attached documents** could be of multiple file types. The user will be able to open the document in the native software depending on the MIME type on double click. There are options to store the attached documents in a file server or within the database. Optionally, every line item in a detail table in the form could be attached with one or more file types. These are maintained and retrieved appropriately.

**Axpert** comes with a built-in form designer that lets developers lay out the form as desired.

There are provisions to apply user **access control** on the form or any of the form elements. Specifically, the controls in any form or any field, frame or button may be enabled, disabled, made visible or hidden, depending on the user login. Optionally, rules may be defined based on the data in the form or conditions that are based on application level settings and configuration, to achieve more sophisticated access controls.

Business rules for every form element can be set using **Axpert** native formulae. Options are available to pull data from other forms or databases and populate into this form. Further, option is available to push data from this form to another form. When data is pushed to any other form, the business rules mentioned in the target form are automatically applied.

Forms have the ability to send **email or SMS** on the occurrence of user-defined events. Optionally, these tasks may be executed only if an attached condition or rule is satisfied.

The RTE triggers the work flow as configured when a transaction is saved. The user roles attached to a workflow will have options to approve, reject or return a transaction. On approval, the transaction moves to the next level. A work flow may be altered easily at any point in time, with no need to write any code. Options are also available to set rules to manage exception conditions or events. Additionally, options are available to delegate a task assigned to a user role.

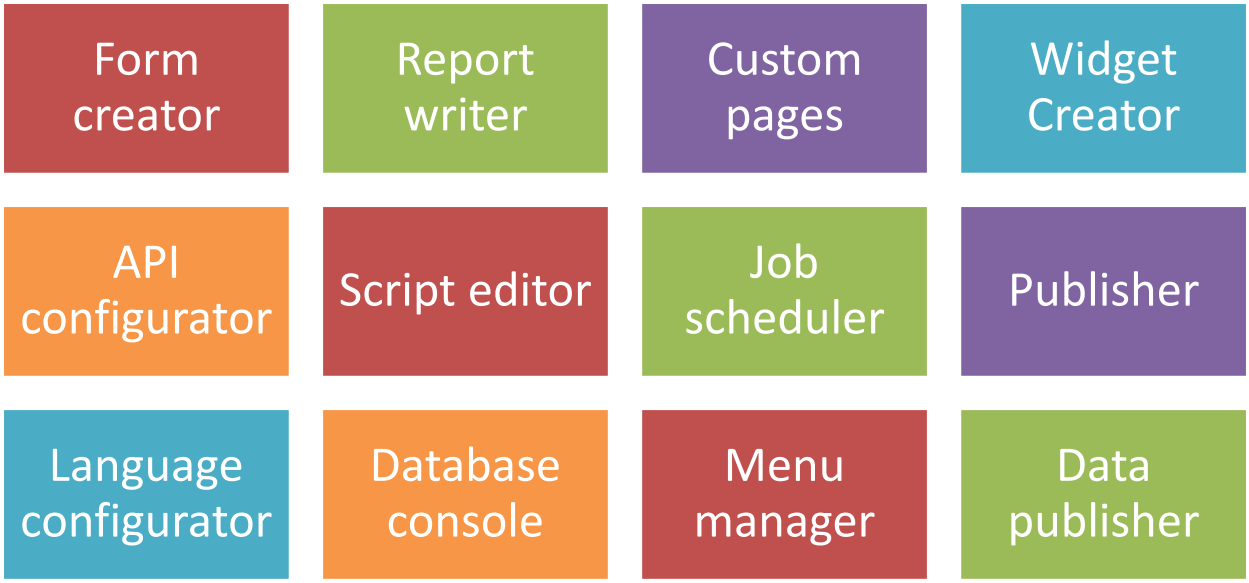
**Axpert analytics** is embedded in Axpert RTE. Axpert identifies the analytical fields in a form based on the meta data and relationships and automatically creates an analytics page. This lets users to aggregate and visualize data on different dimensions. This eliminates the need for integrating other BI tools for data visualisation.

Tabular reports have the provision to export data to MS-EXCEL as well as to save the report in HTML or CSV formats. It has the capability to create drill-downs up to the original transaction. End users can filter, search and sort any report. The filter criteria may contain one or more conditions based on the columns in the report. Report criteria are re-usable in other reports. Pivot reports are supported.

Free-form reports may be created using Axpert PDF designer, that lets users drop text boxes, labels, images, data tables etc. on to a report. The controls may be populated with transactional data from a form or from an SQL result. End users can preview or print any report, including in PDF format without installing a PDF printer.

Axpert RTE is bundled with Fast Reports to cater to complex reporting that is not achievable through its native reporting capabilities.

## Developer studio




### Form creator

Forms are called transaction structures in Axpert. A transaction structure is created by creating the form elements. Forms with multiple frames can be created. Each frame may contain many fields. The frames are called as Data containers in Axpert. The data containers are linked to a table in the backend. The backend tables, the front forms are automatically created by Axpert. There is no need to write code for create, read, update, and delete (CRUD) in DB. Listing, searching and navigations are automatically built by Axpert without having to write code.

### Report writer

Axpert comes with built in report writers to create tabular reports and free form reports. The tabular reports are created only by writing SQL statements. Axpert provides a modern UI for tabular reports with hyperlinks to create drill down reports.

The free form reports are built using the embedded Fast report component. Reports are created by defining data sources and creating various bands as needed. The output of the report may be PDF, HTML, Word doc or MS Excel sheets.

### Custom pages

In any application, there may be a few pages that may need a different user experience that is different from what is provided by Axpert by default. These pages can be created using HTML and Java script using

a tool of the choice of user. The HTML, JS, CSS code along with the images are plugged into Axpert using this option. The data from Axpert can be consumed and pushed into Axpert using the Axpert API.

## Widget creator

Users can create widgets that displays data as KPI, charts & lists. User may also create custom HTML and assign to widgets. Drill downs can be enabled from charts and KPI. The widgets are displayed in the dashboard page in Axpert run time.

## API configurator

Seamless integration with external applications is achieved through API. This configurator lets users configure API of external applications. These API can then be consumed by Axpert. The API can be used as data sources within Axpert forms or may be executed from Axpert forms or scripts. The scripts execution may be initiated based on a user action or from Axpert jobs that be scheduled to run in background.

## Script editor

Axpert scripts are used to create custom functionality by writing scripts. The code completion feature of script editor enables users to write scripts with ease. More info about writing scripts is available in the www.developer.agile-labs.com.

## Job scheduler

Axpert scripts can be executed as background jobs at scheduled time intervals. Jobs may be scheduled to run daily, weekly, monthly or at specified time intervals. This option enables users to create background jobs for various purposes like sending notifications, execute external API, custom code, execute DB routines, data exchange, etc.

## Publisher

The structures, forms, pages, reports, rules that are created an Axpert instance may need to be published to another instance. This is used for promotion of Axpert objects from one server to another. This provides a complete Application life cycle management.

## Language configurator

Axpert supports multiple languages. This option lets users enable support for different languages. User can download all the textual data within the Axpert application. These can be converted to the desired language using any language converter. The converted text can be uploaded back to Axpert. The run time environment will render the application using these string resources based on the language selection done by the user.

### Database console

Axpert comes with an inbuilt database console to access, manage and maintain all the database objects from within Axpert. This empowers users to deploy and support from within Axpert environment.

### Menu manager

Users can manage the menu structure using this option. The menu can be reorganized based on need to make menu access user friendly.

### Data publisher

Data sources can be defined using this option. A data source is created using SQL statements and creating views. These can be published through Axpert API for registered external applications to consume data that is published by users. The data publish API are secured through secret keys to ensure data is published only to intended users.

## Configuration Studio

This provides options for

- managing users
- configuring rules – to change the behaviour of forms based on roles or conditions. This could be used to override or change validation rules in forms.
- adding fields to forms
- creating new forms
- setup work flows
- publishing API for external applications
- creating new reports
- configure notifications
- setup of home page

The config studio does not need any technical knowledge. Domain users who understand the Axpert application and have basic software knowledge (like using excel formulae) will be able to configure applications. This empowers domain experts to implement and configure applications with reduced dependency on tech resources.

## Axpert mobile

Axpert mobile is available for download in Google play store and Apple store. These applications can connect to any Axpert application by scanning the QR code in the application or by providing the connection strings. The connections string will be available in the Axpert RTE. Users can access the Axpert application as a mobile application using this app. The mobile app provides features for geo tagging, geo fencing & photo uploads from mobile device. This enables users to build Axpert apps that may be used for remote data aggregation, attendance, sales force management, deliveries, etc.

## Security in Axpert

When you create systems that store and retrieve data, it is important to protect the data from unauthorized use, disclosure, modification or destruction. Ensuring that users have the proper authority to see the data, create new data, or update existing data is an important aspect of application development. Do all users need the same level of access to the data and to the functions provided by your applications? Are there subsets of users that need access to privileged functions? Are some data restricted to certain classes of users? The answers to questions like these help provide the basis for the security requirements for your application.

Axpert includes a powerful and flexible role-based security model to protect your data according to your application security requirements. There is always a trade-off between security and usability. When a system has no security, then it is open to malicious or unmalicious unauthorized access. When a system is too tightly secured, it might become difficult to use successfully. Before implementing your application security model, it is important to understand the core concepts and features in the Axpert security model. This section provides the data security model and includes the following sections:

- Authentication and access control
- Authorization
- Administration

### Authentication and Access Control

*Authentication* is the process of verifying user credentials for a named user. Authentication makes sure you are who you say you are. Users are typically authenticated with a username and password. Authentication verifies user credentials and associates an application session with the authenticated user. Every request to Axpert is issued from an authenticated user. Authentication, by itself, does not grant access or authority to perform specific actions.

Authentication by username and password is one of the methods. You might grant access to users who are authenticated through a single sign in (managed by ADS or LDAP). This may also be integrated with Aadhar database to ensure high levels of security.

The passwords that are defined in Axpert are encrypted and stored using salted MD5 algorithms. These are secure as the salt key is generated randomly using public & private keys. The system will force users to change their passwords at defined intervals. The system will also force users to provide strong passwords.

## Authorization

*Authorization* provides the mechanism to control data access, For an authenticated user, authorization determines what you are allowed to do. For example, authorization is what allows the access to menu options, buttons or functions in the application. Using authorization users or group of users may be restricted access to classified data.

## Administration

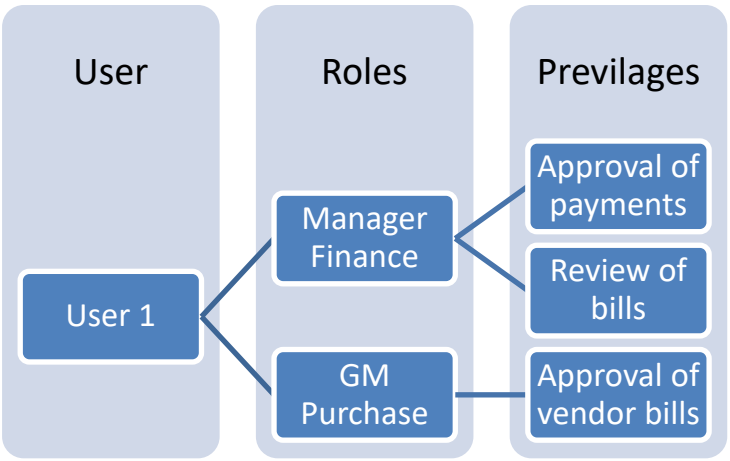
*Administration* is the process of defining, configuring, and managing the security objects, such as users, roles and previlages that implement your security policies.

Privileges are is identified by a unique name and assigned access to the elements in the application like menu items, web services, buttons and links through which tasks are done or data is viewed.

The Axpert Server security model is flexible and enables you to set up application security with the level of granularity needed by your security requirements.

## Role-Based Security Model (Authorization)

Roles are the central point of authorization in the Axpert security model. Privileges, users, responsibilities, and permissions all relate to roles.



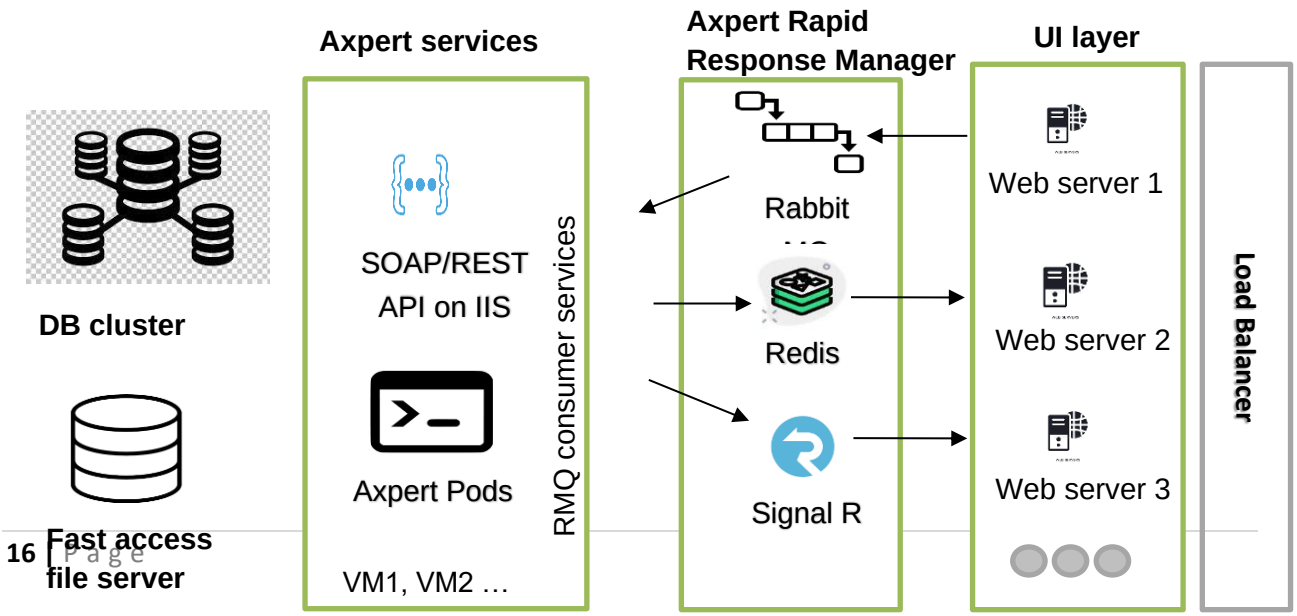

A set of privileges is assigned to a role. A user may be assigned one or more roles. These can set through an intuitive user interface to the administrator to effectively manage the permissions and authority for users.

## Element level security

When a privilege is assigned to a role, it may be assigned every data element in a form or report. The data element could be an input field, a button or a hyperlink. The privilege may be extended to subsets of data by defining data filters and assigning privileges on the dataset.

Granular data access control can be setup by connecting one or more user roles to users combined with user grouping. This enables permissions to be granted on features, modules, elements and sub elements to users for specific sets of data.

# Axpert Architecture



The core Axpert service layer is deployed on IIS. The subsequent release will support other web servers too. The service layer is collection of core APIs that manage the database CRUD operations, searching, listing, form rendering, report rendering, access control, menu rendering and data provider for analytics. This layer is also called the Axpert kernel.

The Axpert Rapid Response Manager also called the ARM provides API to use the services of Rabbit Messaging Queue, Redis in memory database and SignalR to manage notifications. This layer enables Axpert applications to scale when concurrency increases. This layer also stores meta data & frequently accessed data which significantly enhances the performance of Axpert applications.

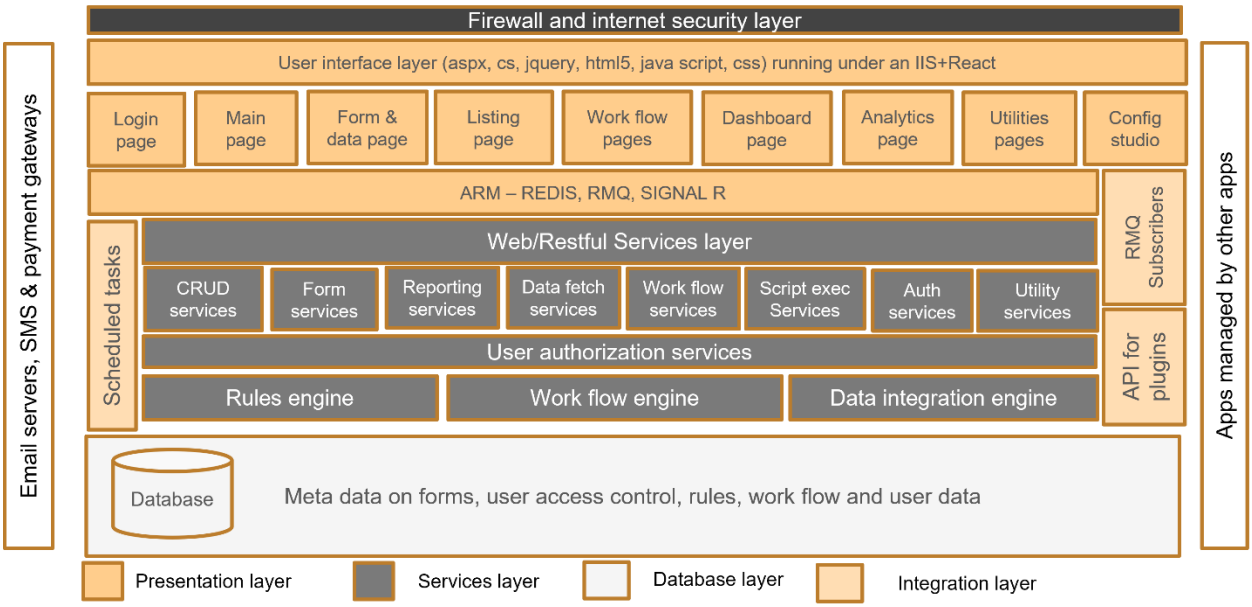
The presentation layer is a set of servers that are used to deploy the web pages and HTML pages and renders the default UI of Axpert. These are built using MS aspx framework and deployed on IIS. The subsequent version of Axpert will move the presentation layer to React framework and the services layer to dot net core.

Each layer can independently scale to as the load increases. For a standard application to support fewer concurrent users, all these layers can be combined into 1 or 2 VM depending on need.

Axpert support Oracle, MS SQL, PostgreSQL and MySQL databases. Axpert apps can be developed on any selected database.

## Axpert services diagram

The below picture provides a pictorial representation of the micro services based architecture of an Axpert application.




## Axpert synchronizer(ADR) for disconnected computing

This is an application that manages data exchange between two Axpert locations. This will enable implementation of distributed data architecture (store and forward smart client). This is achieved by submitting the structures to the synchronizer that need to be synchronized between servers. The synchronizer will automatically detect the new/modified data in the structures and send to the other servers it is intended for. The server identifications of the different server to which the data needs to flow can be made part of the structure in data elements.

## Training on Axpert™– Approach and Methodology

Two months of hands-on training will be provided to understand the basic concepts of Axpert™. At the end of this training, developer will be able to develop apps on Axpert™. This will also include handing over of creating custom plugins and customizing the native pages in Axpert. This will also cover the ways and means of integrating with other apps. Agile developers will be part of the team for the first project for a

period of 6 weeks. The Agile developers will only guide the trainees to develop and deploy their first app on Axpert™.

## Skill is required to create an application on Axpert™

Apart from domain knowledge a good knowledge on database and SQL statements is the basic skill required for building applications on Axpert™. The know-how on using Axpert™ IDE is also needed. However, the Axpert™ IDE is a simple GUI driven intuitive tool that may not need very extensive training on using it. The tool can be mastered in a few days. UI Designers and front end developers can change the user experience of Axpert.

## Standard server and infrastructure requirements

- Axpert server – Deploy Axpert services & web pages on IIS. O/S – MS Windwos
- ARM server – Deploy the ARM API, RMQ, Redis and SignalR. O/S – MS windows or Linux.
- File server – Storing files, pics and documents. For smaller apps, this can be configured in the Axpert server.
- DB Server or DB service – The database is hosted in this server or configured as a service in case of a public cloud.

# Frequently asked questions

### Is Axpert scalable?

Axpert follows a simple web/Restful services driven model that is an industry standard. Hence, it is light weight and can scale to cater to any number of users or transactions.

The web services mainly perform the following operations

- String parsing
- Pass SQL to database

The rules are predominantly executed through optimized string parsing. Hence, these are not long running web services and hence will not affect scaling.

The SQL statements are just passed to the database with right parameter values. Hence, in many cases Axpert acts as just a conduit to database.

So, the level of scaling that can be achieved is directly dependent on the capability of the server. When a strong RDBMS is used scaling does not become an issue at all.

### There may be performance degradation because Axpert parses the structures for every request. Is this true?

Further, the structures are parsed only the first time and stored in the in-memory database. Hence, subsequent executions will do only limited parsing. The leanness of the web services and the advantages offered by a process independent application significantly scores over this small overhead.

### Can complex business processes be defined as process structures?

The concept behind Axpert is based on sound database principles. A transaction structure which is the basic building block of Axpert is defined as a collection of related database tables along with business rules. Hence, database applications of extreme complexity may also be developed with ease.

Axpert has already been used to build large apps mission critical apps for Government, Defense and ERP for large corporations.

### How is it different from building an application using visual studio for dot net or any visual java development tool?

The basic difference is the amount of programming that needs to be done is significantly reduced. Complex applications ERP, CRM, HMS, HCMS, etc can be built without writing programs in any programming language. However, fundamental database and SQL (select statements) knowledge is necessary.

Storing business processes as data will provide an additional advantage of having tools to bring out process dependencies and flow pictorially. This will increase control on the application and also make it responsive to changes.

Coding may be needed only for bridging with other applications or devices.

Hence, there will be considerable effort reduction in the overall ALM.

### How many process structures can there be in a system?

There can be any number of process structures in a system. A process structure can also have relationship with many other process structures.

### Can Axpert be deployed on a Linux or Unix server?

The current version is available for deployment only under a MS Windows. However, the database can be deployed in Linux or a UNIX server.

### What kind of skill is required to create an application on Axpert?

Apart from domain knowledge a good knowledge on database and SQL statements is the basic skill required for building applications on Axpert.

The know-how on using Axpert IDE is also needed. However, the Axpert IDE is a simple GUI driven intuitive tool that may not need very extensive training on using it. The tool can be mastered in a few days.

### Can the data in an available database be re-used?

The data available in the database in other tables can be re-used just by using SQL statements. SQL can be attached to any data element in a structure or can be used to populate data into the structure. Hence, data available in the same database can be re-used without any additional effort.

### How can it interact with other applications?

Axpert publishes all its application functionality as web services. So, any external application can read data from Axpert using its web services. Functionality of other applications can be executed from the structures by making web service calls.

Standard interoperation with all productivity tools like XL, Word, PDF are provided by default in Axpert. These can be integrated at any level and to any screen.

Table structures are published to enable end users. So, any other external application can also do a data level integration with Axpert.

Standard importing and exporting routines are provided into any screen where data is input from XML and CSV files.

The enterprise version also comes with an exchange server that can do scheduled data exchange. The data format for exchange is XML.

### Is it not better to use off the shelf products instead of creating process on Axpert?

Wherever standard products fit the business process, using them will be a better choice. However, if the product needs deep customization then it is better to go with Axpert. This is because deep customization will consume a lot of time and effort and will also render the product less responsive to changes.

Moreover, business processes that are rules driven and the ones that change quite frequently will be better if defined as process structures because of the high maintainability that is guaranteed by Axpert.

### How reliable is Axpert?

The Axpert server has been providing results in few hundred plus customer sites for varied purposes. Some of them are very large enterprises including the Government, Defnese and large corporations. The process structure driven method has been delivering results for the past many years without any problem.

All the companies that own Axpert did not go in for another solution after putting the solution in place. All business processes have been built as structures on the Axpert.

### How secure is Axpert?

The data and the process structures are stored within the database server. So, the security is as high as a database server. The ASB itself is a set of web services that are deployed under a web server. Hence, all the security policies that are applied on the web server apply to the ASB too.

The data transfer over the wire can be made secure by using HTTPS instead of HTTP. The standard set of web pages that come along with Axpert have been tested for common vulnerabilities like Cross site scripting, SQL injection and the likes.

Axpert allows creation of user roles. The access control on every structure can be defined for every role. Users can be assigned to roles. So, unauthorized access to the structures is blocked by the Axpert. The users, roles and their passwords are also stored in the database. The passwords are stored encrypted using industry standard algorithm. Hence, the application and the data are very secure.

### Does it support HTTPS?

Yes, it does support HTTPS.

### How many concurrent users can it support?

The number of concurrent users depends on the web server and database server configuration. Axpert is deployed under the web server. In case the concurrent user access need to be increased, more web servers can be added along with the ASB and a load balancer can be put in place.

So the capacity of Axpert is determined by the configuration of the web server and the capability and configuration of a DB server.

### How can an application built on Axpert be migrated to other technologies?

An application is built as a set of process structures. These process structures can be viewed using the Axpert Stem. All the business rules and the flow are part of the structures and hence the complete application can be viewed using the Axpert Stem.

Moreover, the process structures are stored in XML format in the database. So, even without the help of the Axpert Stem, these can be used to migrate to other technologies. Moreover, the database structure is open and published to you.

The effort involved will be the same as seeing an application developed in one programming language to another.

### In what domains can applications be built on Axpert?

Axpert is domain neutral. Applications can be built for catering to any business process in any domain. This is because a process structure (the central piece in the application) is an extrapolation of table structures that can be used across domains.

### Can a web site be built using Axpert?

It is not intended for doing it. It is more a transactional system. However, it can be integrated with content management systems by doing a data layer or app layer integration through web services.

### How is work flow handled?

A status based work flow can be defined as part of process structures. The status field can be updated based on different rules and additional actions can be attached to the status. For example when the status changes may be a mail needs to be sent. Scripts can be used to define more complex work flows. Axpert comes with a very comprehensive work flow engine that can handle needs where data flow route has to be determined dynamically based on the data entered.

### How is access control implemented?

Axpert allows creation of user roles. The access control on every structure can be defined for every role. Users can be assigned to roles. So, unauthorized access to the structures is blocked by Axpert. The users, roles and their passwords are also stored in the database. The passwords are stored encrypted using industry standard algorithm. Hence, the application and the data are very secure.

### Can record level access control be implemented?

Record level access control can be implemented as part of access control. That is for every role, the access to transactions that satisfy a given condition can be set. This will provide very high level security on transactions.

### Can field-level access control be implemented?

Access to every data element in a structure can be controlled based on role. When a user logs in and access a structure, depending on the role assigned to the user the access is governed by the Axpert.

### How can process structures be integrated with other apps?

Bridge programs need to be written that consume web services from ASB and call the API provide by other apps to do the integration. This can be done on a case to case basis. This is required if an app level integration is to be done. A near real time integration can be achieved by using ADX that is shipped along with Axpert. This can exchange data between Axpert and an external by pushing and pulling CSV files on a common server.

### Can external devices be integrated with Axpert?

Web services that integrate with external devices can be attached to Axpert. These can be made part of an action associated with a structure. Axpert now supports barcode readers.

### Can SMS be sent from Axpert?

SMS can be sent from Axpert by integrating with a SMS server. There are ready to use documents available to implement these.

### How to implement an approval system?

An approval system is defined as a status based work flow. An elaborate approval flow can be defined by defining roles, users, and defining a flow through different roles. The flow can also be dynamically determined.

### How to connect to crystal reports?

A VB program can be written to print using crystal reports and can be run as a web service. The data from Axpert can be got through web service or by connecting directly to database and using SQL statements.

### Can the application developed on Axpert be integrated with an existing portal?

Axpert can provide the structures within containers (iframes) that can be embedded into any portal. Hence, this feature can be used to link enterprise to web portals.

### How are applications deployed to end customers?

The ASB, web pages are deployed under IIS just like any other dot net web application. The process structures are copied from the development server using export option and imported into the database in the productions server.

### How are applications tested?

Applications can be tested just like a coded application. However, an extensive test on the functionality provided by Axpert need not be done because it is already tested. The functionality of only the structures need testing.

### How is up gradation managed?

Upgrades to process structures can be done on site or can be done off site and imported into the database server any time. However, before every deployment of new process structures a thorough test is suggested.

Upgrades to Axpert are needed only for making technology extensions. When this is done, a new version of Axpert re-deployed onto the production server. Axpert comes with a tool to upgrade. This is rung to upgrade from one version to another. However, a sanity test of the application may be needed after upgrading Axpert. In case the Axpert version changes the data format of the process structures, those are done automatically.

### Is the customer vendor locked?

The customer is not vendor locked because the complete application is stored in the data base in XML format. The table structures that are created by Axpert are transparent. So, any time an application that is built on Axpert can be migrated to other technologies.

New processes or changes to existing process structures can be made without the help of vendor if the customer possesses the license for Axpert IDE. In fact possessing the Axpert IDE will empower end customer to the extent that there will be no dependency on the vendor.

Moreover, since it is web services driven, it allows high degree of inter operability and there is no need for depending on software vendor to provide hooks to other applications.