BankMill Magic

Banking ERP - *"CBS Centric ERP"*

Overview

BankMill Magic is a Banking ERP which provides all the modules required by a bank to do all their work.

It is built using a multi layer implementation stack as given in the diagram below:

| CBS	Other ERP Modules
Magic Framework	
UX Programming Languages	
Front End Programming Languages	
Middle Tier Programming Languages	
Database & Storage Layer	

This document explains this stack and the features of the CBS and the other ERP Modules.

The Magic

BankMill Magic offers 100% Complete Banking ERP centred around our flagship CBS functionality for all bank sizes from large commercial banks to smaller financial institutes such as MFIs and Cooperative Banks

BankMill Magic™ - Core will spellbound you with its magical features:

1. **Pre-Filled form generation based on natural language inputs using AI:** Users can enter what they want to do using plain english sentences, and the appropriate form pops up with the user entered information.
2. **Charts**. Custom charts in forms of line chart, pie chart and histogram are associated with screens
3. **Chatbot**. AI based chatbot is included on every screen to answer your and your customers' queries.
4. **Cutting Edge Security:**
   a. BLAKE2 (Better than SHA2) for hashing
   b. AES (better than 3DES) for encryption
   c. User login is based on authorised device id check
   d. Multi-factor authentication - OTP and Biometric based login access
   e. n-Tier architecture
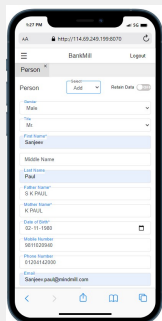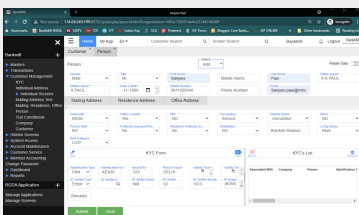
f. Regular Expression based syntactic checks at 2 levels (Front end and Middle Tier)

5. **Dynamic Fields** (Only those fields will magically appear which you need, the remaining stay hidden based on context)

6. **Generative AI Based Software:** Screens and Fields along with validations and connection to the middle tier / database can be made within moments.

7. Inbuilt **training, user test and demo**

8. **Interstellar Speed**. The technology used such as MongoDB (100 times faster than SQL) in combination with proven and many new cutting edge technologies gives you speeds that you have never experienced before. All UX processing is done on the client computer and not server.

9. **Multitasking (Multiple Tabs)**: The software allows the user to open multiple tabs and the user can work on them simultaneously.

10. **Multilingual Software**. Both transliteration (script change, e.g. "Ajay" to "अजेय") and translation (dictionary base, e.g. "Home" to "घर") supported at a flick of the switch.

11. **Print Reports / Download Data** from every screen

12. Regular Expression based **syntactic checks** for each field (Both in frontend and backend)

13. **Responsive/Cross-Platform Front End**. The software can run on any device from Desktop to a mobile phone browser and is also available as an app for IOS and Android. The screen and fields rearrange themselves magically based on the device size and layout. You can now do your work literally from any place on this planet.

14. **Stunning and User Friendly UI** gives an ethereal feel when you work on it with such amazing features as auto screen resizing, cascading navigation panel, floating labels on each field and soothing colours.

15. Search returns a **spreadsheet style** output with all spreadsheet style actions allowed such as printing, downloading, searching, sorting, hiding, moving columns and filters.

USP

The main USP of the product is its extensive use of AI based RBE (Rule Based Engines) and Heuristics based AI code which is spread across the entire software. The ecosystem of the various AI codelets is controlled by an extensive system of neurons which constitutes the brain of the software.

The administrator can use this AI capability to generate new screens, and modify the fields or add language features in any field including translation and transliteration. This will enable organisations to create the application which suits them 100% rather than using an application which is "One size fits all".

ERP Modules

The BankMill Magic ERP has the following modules inbuilt in it:

- Core Banking: This module manages all the core banking functions such as account opening, deposits, withdrawals, and other transactions. All account types such as CASA, Deposits, Loans, CC/OD, Remittances and Lockers are supported.
  - *All entries done are automatically reflected in Company Accounting and Customer Relationship*
- Accounting: This module manages the bank's financial accounting and reporting.
  - *Balance Sheet of entire bank is reconciled from each module and*

transactions
  - ○ *No banking transactions need to be entered in accounting module and no accounting transactions need to be entered in CBS*
- Business Intelligence (BI) and Analytics: To provide data-driven insights into the performance of the bank (At individual resource level such as Employee, Employee Group, Branch, Account, Customer Groups and each Product) and support informed decision-making.
  - ○ *Holistic view of the bank can be seen by the management. Various performance indicators take data from different modules and give accurate data*
- Customer Relationship Management (CRM): This module helps to manage customer interactions and relationships including the concept of a Relationship Manager. New products can be sold to the customer from this module.
  - ○ *Allows relationship manager to open accounts or issue cards as per conversation on call with customers*
- Delivery Channels: To provide customers with secure access to banking services through mobile and online channels which use the same engine for front and backend as used by the remaining application to provide a singular experience to all stakeholders in the bank. Additionally all required delivery channels are supported.
- Fixed Asset / Depreciation Management: This module manages the bank's fixed assets. It provides support for both the Income Tax (Straight Line Depreciation) and Company Accounting (Accelerated Depreciation) based depreciation.
  - ○ *Whenever an item is purchased/sold, entry only needs to be done once. All details are available for ROC and Income Tax*
- FOREX: Support for multi-currency is available in the ERP.
  - ○ *Ensures correct mark to market position of data*
- Human Resource Management (HRM): To manage personnel and workforce management, including payroll, benefits administration, leave sanction and appraisal management.
  - ○ *Allows human resources of the bank to request for loans directly*
- Loan Origination System: This module manages loan request entry, loan workflow, disbursal, repayment, and interest calculation. Different charges and NPA is also managed.
  - ○ *Same data doesn't need to be entered into CBS once loan is sanctioned*
- Risk Management: This module helps the bank manage various types of risks such as credit risk, market risk, and operational risk.
  - ○ *Allows management of risk across all modules*
  - ○ *Allows handing inter-modular risk*
- Report Generation: This module generates various reports such as financial reports, management reports, and regulatory reports.
  - ○ *Inter-modular reports can be generated*
- Recovery & Legal: This module helps the bank recover the sub-standard and NPA loans including tracking legal progress.
  - ○ *Recovery module gets automatically updated through CBS*
  - ○ *Recovery agents can use the same software to do receipt transactions*
- Regulatory Compliance: To ensure compliance with banking regulations and standards, such as Financial Intelligence (FIU), Anti-Money Laundering (AML) and Know Your Customer (CKYC/KYC) regulations.
  - ○ *Data doesn't need to be extracted from CBS to check regulations compliance*
  - ○ *Real time regulations compliance as black-listed warnings are given in real time*
- Supply Chain / Inventory Management: To manage procurement, inventory, and distribution processes.

- ○ *Once inventory is purchased in accounting, it automatically becomes a part of inventory management*
- ○ *If inventory is discarded, sold or lost, impact is shown automatically in company accounting*
- Support Management: This module allows customer issue management with Ticket Issuance, SLA, Problem Solution Workflow, and Customer Notification support.
  - ○ *Single support person can read and check issues*
  - ○ *Different departments can log support issues*
- Trade Finance: This module manages trade finance operations such as Letters of Credit and Bank Guarantees.
  - ○ *No need to do re-entry as information is available to all module*
- Treasury Management: This module manages the bank's treasury operations such as Financial investments, borrowings and liquidity
  - ○ *Treasury manager can use CBS to identify float*
  - ○ *If there is a need for cash, borrowings can be done directly*
  - ○ *Brokerage/processing fee does not need to be entered again into company accounting*

Engagement Process

BankMill believes that each bank is unique with its own unique needs. Software cannot assume that one size fits all.

BankMill Magic is a symbiotic journey where the bank does not only purchase the software but creates a symbiotic relationship. The bank can engage a number of software engineers stationed at MindMill. These engineers will work solely on creating unique changes needed for the unique needs of the bank. They will work on tasks given by the specific client and according to the priority given by the bank.

Development Journey

The team included the best brains the world has to offer to bring together amazing design, technology, research and development.

This magic was made possible by replacing traditional programming by AI Bot Based Programming. We have created multiple Bots (AI agents) in the universe of this application which are working symbiotically to create this magical ecosystem.

It takes moments to add new fields and screens and connect them to the backend

Core Banking Features

The unique features of bankmill rarely present in any other CBS :
- AML Support
  - ○ Duplicate Customer Check Based On Name And Address
  - ○ Suspicious Transaction Alert & Report
  - ○ Blacklist Handling
  - ○ FIU Support
- USP at Architectural Level
  - ○ Normalised Database
  - ○ RBE & Heuristics based AI
  - ○ Neural Nets
  - ○ Blockchain in balance calculation
  - ○ Straight Through Processing / Real time transaction
  - ○ Service Oriented Architecture
- Automated Processes
  - ○ Agent Commission

- ○ Automatic NPA
- ○ Auto Inter Branch Reconciliation
- ○ Day End
  - ■ Both Automatic And Manual Option Available
  - ■ Both Centralised and Branch Based Options Available
- ○ Customer Category Auto Updation (Normal To Senior Citizen And Senior Citizen To Super Senior Citizen)
- ○ GST/CGST
- ○ 150+ Automatic Service Charges
- ○ TDS Support
- Complete Set of Reports
  - ○ All Central Bank (e.g. RBI) /Xbrl Reports
  - ○ All Banking MIS Reports
  - ○ All Company Accounting and IT related Reports
  - ○ Country Specific Modules and Reports Support
- Customer Management
  - ○ Account Opening and Closure
- Delivery Channels:
  - ○ Mobile Banking
  - ○ IMPS (Both Outward And Inward) / UPI
  - ○ SMS Banking
  - ○ USSD
  - ○ Whatsapp Banking
  - ○ Email Banking
  - ○ Chatbot Banking
  - ○ Debit Card Interface / Loyalty Program Support
  - ○ ATM Interface / Switch
  - ○ Mobile money
- Ease of Usage
  - ○ Single Customer, Member Registration and Account Opening Screen
  - ○ ATM Reconciliation
- Enterprise Service Bus (MindConnect):
  - ○ ISO 8583 Support for all standard financial transactions with following capability: JSON / XML /Stream
  - ○ All features of CBS are available as an API via a CXS interface of our enterprise bus.
  - ○ USSD interface available
- Fintech / Neo Bank / Digital Bank
  - ○ No branch banking required for customer interfacing
  - ○ Customer can initiate account opening
  - ○ Credit score based account opening approval and loan sanction (via Loan Proposal Workflow)
  - ○ Online KYC
  - ○ IMPS / NEFT - RTGS / UPI Banking
  - ○ USSD Support
  - ○ Money Wallet
- Management Support
  - ○ Dashboard (Configurable)
- Transaction Support
  - ○ Transfer / Cash / Clearing
  - ○ NEFT - RTGS
  - ○ Remittance

- ○ Lockers
- ○ Loan Repayment
- Virtual Accounts
- Other Modules
  - ○ Agent Banking
  - ○ Complete Legal Module
  - ○ Complete Loan Origination System Module
  - ○ Card Management Software
- Other Benefits
  - ○ 24/7 Support
  - ○ Single Vendor For All Modules
  - ○ All Modules Integrated
  - ○ Own IPR
  - ○ VAPT Certified
  - ○ Cmmi Level 5 Certified
  - ○ Cisa Certified
  - ○ 100% Parameterisable
  - ○ Compliance To Latest Security Norms
  - ○ More Than 1M Transactions Per Day

Administration Features
- Fully integrated with a variety of delivery channels such as Internet Banking, Mobile Banking, Email Alerts, Touch Screen Kiosks and IVR systems.
- Product Definition: Highest possible level of parameterizing available
- Interest Definition: High level of parameterization available
- Masters, Control Values and other Parameters: : High level of parameterization available
- Service Outlet Concept: Each branch or delivery channel is designated as a service outlet and each transaction can be tracked at a service outlet level.
- Maker Checker Concept: Allows the bank to have double or triple checks in place by having one person make an entry, another to verify it and sometimes if necessary a third to re-verify or enable it.
- MindConnect™: Allows the bank to provide financial transaction access to IIIrd party solutions such as ATMs and Credit Card Institutes such as MasterCard and Visa.
- Multilingual
- Roles and Rights: A bank can create various roles (designations) based on its Organisation Chart and associate view, create, modify and delete rights on each screen as well as access to the screen itself.

Accounting Features
- Real time transaction processing
- Straight through processing
- Tree Based multi level GL Head Structure
- Single bank-wide General Ledger, Profit & Loss and Balance Sheet for all modules
- Detailed MIS including Asset Liability Reports
- Text and WYSIWYG (what you see is what you get) based Reports
- Inter-branch Reconciliation
- True Multi Currency

Cost Reduction Features

- BankMill™ offers the lowest total cost of ownership and operations compared to any other CBS available in the market. This has been made possible by incorporating the following features:
- All the modules in the system are 100% integrated with each other. There is no movement of files and no manual processes are needed to accomplish inter-module transactions. All inter-module and inter-branch transactions happen in true real time.
- Reports are available in Java which implies the bank does not have to invest in IIIrd party reporting tool licensing such as Crystal Reports.

Customer Related Features

- Unified Relationship Management across related but different customers and Multiple Accounts of the same Customer
- Single account book means all transactions across all delivery channels are made at the same place and the customer can get a unified view of his account.
- Accounts can be opened at any level including tellers.
- All customer services are available, including cash, clearing, and transfer.
- Completely parameterized standing instructions input and execution including prioritised debit from multiple accounts and rule based credit to multiple accounts.
- Cash pooling of all accounts of a customer for interest purposes with rule based amount outflow to different accounts to allow customers the maximum benefits across branches
- Statement printing is available from all the various delivery channels

Security Features

- Audit Trails: Audit trail of each transaction in the system is kept with date, time and user-id stamp.
- AES Encryption: All data between a device and the backend is transmitted after encrypting it with AES encryption. This prevents any snoopers from sniffing the channel and getting financial data information.
  - Why AES - AES is much faster than 3DES, and is also more secure. The encryption key lengths of AES range from 128, 192, and 256 bits, whereas 3DES uses a 168-bit encryption key. Additionally, AES is more resistant to attacks than 3DES due to its avalanche effect
- BLAKE2 hashing: All passwords are kept using BLAKE2 hashing. This prevents the administrator from knowing the passwords of any user.
  - Why BLAKE2 - BLAKE2 is a cryptographic hash function that is faster than MD5, SHA-1, and SHA-2.It also provides improved security compared to MD5, SHA-1, and SHA-2, and is designed to be resistant to attacks such as length-extension and multi-collision attacks.
- Data Security: Data is kept secure using database login and password
- Access Security: By Role and Rights explained more in Administration Features

Other Features

- Regulator based Inward Clearing
- Image based Inward Clearing
- File based Inward clearing

	● Deposit Receipt, Passbook, Remittance, Membership Certificate, Share Certificate, and Notice Printing
Magic Features (For Application Building)	The following features are available for application building using Magic: ● Make fields editable / non editable ● Show and Hide fields in different screens and for each screen in a different process. E.g. during create a account number may not be required but during verify and edit the same is required ● Field values can be filled based on dependant fields of the same screen or fetched from database ● Using a screen as a child screen in any screen as search or inline ● Field based warning and error processing ● Arithmetic based calculations are supported on a field basis
Technology	The front end uses technology such as: ● HTML ● Javascript ● CSS ● DOM ● Ajax ● REST API ● JAVA ● Spring Configuration Storage is MongoDB The middle tier and backend tier uses Java and SQL respectively. Data interchange happens via encrypted and compressed JSON/XML structures. **Security** ● Multi-tier architecture ensures that no user can access the internal databases which are well hidden from the users. ● Syntactic and semantic validation at UI level as well as at the middle tier ensures that any user cannot hack into the system. ● The software can work with any standard RDBMS such as MS SQL, and Oracle. ● Password structure can be configured on an organisation basis. User is prompted to change the password after a certain time duration. ● Device ID based authentication allowed. ● Right click is disabled. **Architecture** The software has a 3 tier+ architecture where the front end is a user machine browser / app resident, the middle tier (business layer) is SOA based and implemented on the application business layer servers. The database is on the 3rd layer which is implemented on the database servers. The user resident layer cannot access the database servers directly. The system works via interdependent nodes communicating with each other via several layers of servers and technology.

About Mindmill

Mindmill was established in 1993. It has over 300 full time employees and clients in 22 different countries. It provides software solutions and support to clients all across the world directly or via its local authorised partners. It has products in the BFSI domain and BankMill™ is its flagship product. It is an ISO 9001:2008 and CMMi Level 5 Certified company.

Mindmill has an exceptional level of expertise in implementation of CBS using cloud architecture including WAN design and Security Setup. Mindmill has unparalleled response and 24 x 7 help desk to support clients all over the world.

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