

iKen Studio
Your companion for
an Intelligent Move



www.ikensolutions.com



A complete Web-based Integrated Development Environment

An environment to develop enterprise applications and decision support systems, that are backed by or enhanced with hybrid AI (Artificial Intelligence). Supports integrated architectures of intelligent techniques: expert system, neural network and case-based reasoning along with analytical methods



iKen Studio : Technology Highlights

- ❖ A complete integrated tool : Uses a **unique** and **novel** way to integrate three computing tiers : databases, business logic using AI techniques themselves and client functionality in unified and seamless way.
- ❖ **Server based computing** (thin-client and browser-neutral) that can work like **ASP** (Application Service Provider) software.
- ❖ Complete **Web-based environment** (development, management, administration as well as configuration).
- ❖ **Highly Productive Environment** : Interfaces to build HTML forms, reports, SQL queries interactively, can be managed with less programming expertise : saves programming efforts.
- ❖ Plug-and-play database access **XML layer** for data extraction, integration, transformation and manipulation from multiple database.
- ❖ **No specific database** requirement, it can easily plugged to existing operational database.
- ❖ Easy integration with existing business applications.
- ❖ **Use of hybrid approach** : Addresses diverse set of applications right from expert product advisor to decision support.
- ❖ Solutions based on iKen Studio can be **customized** or managed with little efforts.

❖ **Server Plat-form**

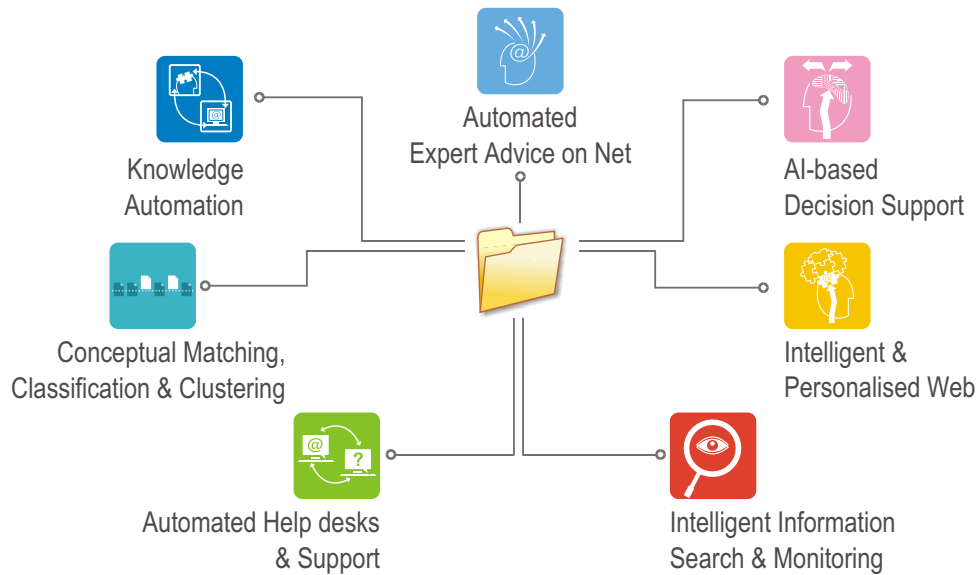
Operating System : Windows XP/2000/2003

Database Server : Any database

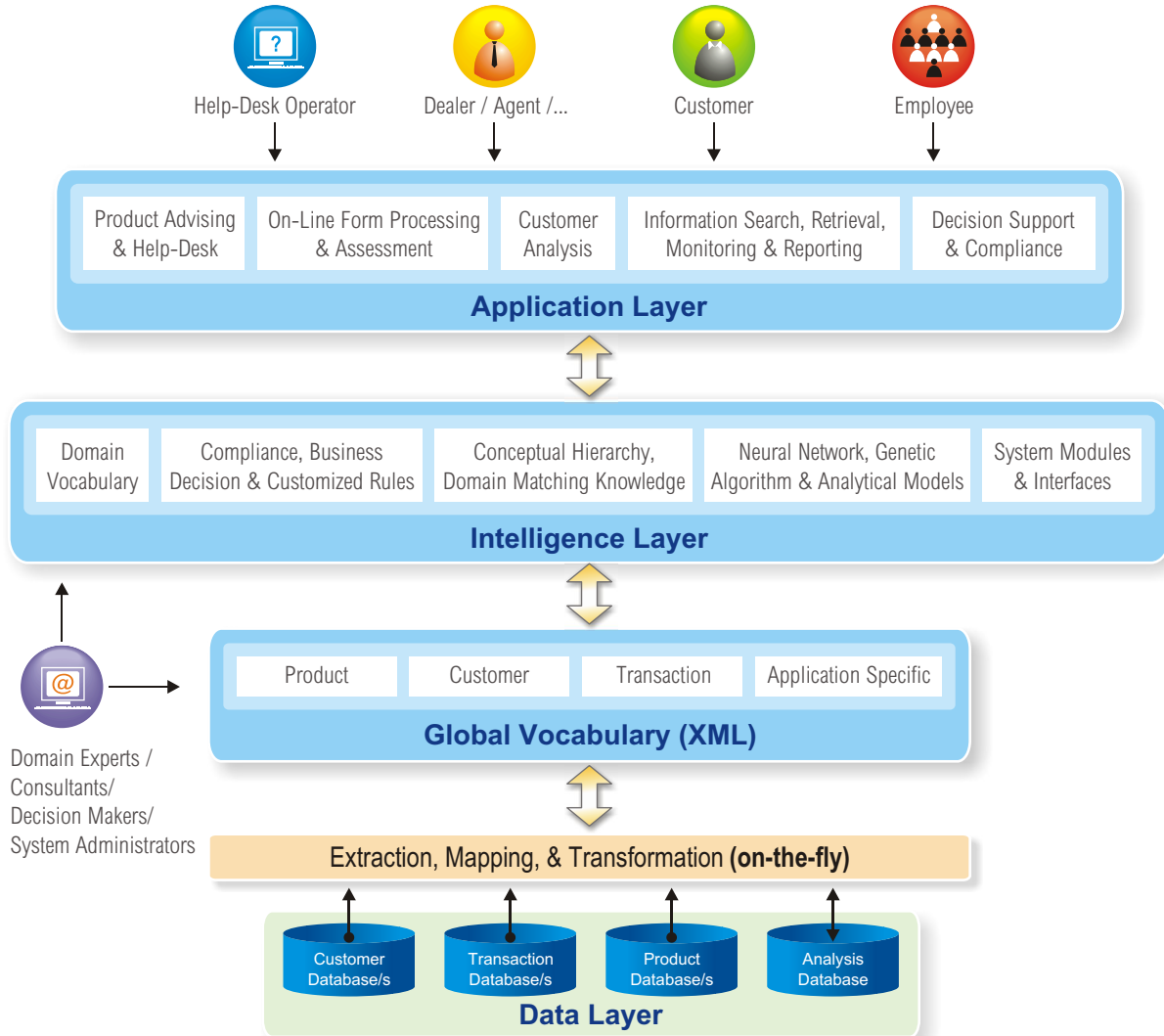
❖ **Client Plat-form**

PC / Machine / Device /

Kiosk supporting any browser



GENERIC SOLUTION ARCHITECTURE



To develop intelligent business solutions

- Traditional business systems automate business processes and deal with data while intelligent systems **automate expertise and deal with knowledge**
- Intelligent systems facilitate to extract, acquire, represent, preserve, use and apply knowledge. Make knowledge available not only internally but also externally.
- The major advantages : **objectivity** and **consistency** in decision making, preservation of valuable expertise, train new stakeholders, free experts from routine jobs, flexibility in managing business rules, etc.

To use integrated approach

- Intelligent systems differ in ways they acquire, represent, store, deal with and apply the knowledge.
- Combining these techniques reduce their weaknesses and increase strengths, makes it possible to solve the complex tasks, helps in better decision - making and 360 - degree (qualitative as well as quantitative) analysis.

To develop smart, dynamic and adaptive websites

- Rescue users (visitors and customers) from information overload, be smart to understand them well and what they are looking for, guide them intelligently like a human expert, move from information-based to **knowledge-based**.

- Engage users through easy to understand Q&A session like an intelligent sales person, make websites more personalised.
- Let users be **self-serviced** to get automated expert advice for 24/7.
- Capture conversations live, do analysis, understand users' interests, know your **popular products**, use it for **cross-selling**, etc.

To develop centralised decision solutions

- Centralized web-based decision support systems make the overall decision making more objective, consistent, reliable, fool - proof and a centralized activity.
- Management has stronger control, decisions are made under broad policies, constraints, rules and regulations of organization.
- Thin client web-based solutions help the decision maker to access the system by using a machine with Internet browser.

To enable intelligent search, retrieval and monitoring

- Traditional operational databases are transaction oriented. Intelligent systems can make them databases speak by **searching, monitoring and interpreting** them intelligently.
- It can help to keep close watch on **database** and generate alerts or **early warning signals**.

Solutions based on iKen Studio



Knowledge Automation

- Manage dynamic business rules
- Retain and reuse in-house expertise
- Maintain regulatory compliance
- Enforce decision rules : make them consistent and objective
- Make business systems intelligent by incorporating knowledge



Automated help-desks and support

- Make complexity simple
- Reuse maintenance experience
- Guide customers in product selection & recommend them right products
- Self-service Interfaces
- Intelligent help and troubleshooting



Knowledge-based websites and Intranets

- Move from information delivery to knowledge delivery
- Deliver expertise on-line : virtual consultant
- Save experts' time and serve large customer base 24x7 days
- Personalize Web : Understand visitors, customers and employees
- Lightweight and less crowded user interfaces
- Smart Intranets



Knowledge-based decision support

- Advanced AI based decision support system using rule-based, neural network, case-based systems, genetic algorithms and analytical methods
- Analyse data and detect inconsistencies
- Reuse experience : e.g. dealing with customers
- Analyse, match profiles and predict behaviour
- Identify up-selling and cross-selling opportunities



Intelligent information search and retrieval

- Flexible and guided quick information retrieval from databases
- Retrieve and search based on subject context and conceptual similarity

Rule-based Expert System Engine

- XML and Web-based Expert Systems can easily be developed and deployed.
- Easy to use and understand IF...THEN...ELSE rule format. Rules can be written like simple English sentences. Supports rules for multiple expert systems logically separated into application groups. Rules are stored in intermediate format at run time rather than interpreted each time. Rules are checked for various syntax and semantic errors. Rule Manager facilitates interactive environment to manage the rules.

Supports

- Backward as well as forward reasoning
- Large number of data types: Number, Real, Text, Date, List, DynamicList, Trend, Matrix, Boolean, Document, URL, etc
- Various mathematical, string, list, date, matrix, trend, graph database functions
- Special operators and functions like INCLUDE, IS BETTER THAN, SCORE_OF, PROFILE_OF etc. reduce number of explicit rules. eg : expressions like : Customer.Education IS BETTER THAN Diploma, STATUS_OF Customer. Age IS Young Customer. Income Documents INCLUDE [PAN,Form16] etc.
- Use many databases simultaneously, no explicit database programming is required: like opening database connections, executing SQL command, opening record-sets, populating data etc. The database interfaces manage extraction, mapping and transformation of data. The data from SQL queries is populated into session data and vice-a-versa at run time.

The logo for iKen Studio Core Engine, consisting of a white speech bubble with a tail pointing towards the bottom-left. Inside the bubble, the text "iKen Studio Core Engine" is written in a blue sans-serif font.

iKen Studio Core Engine

- WHEN NEEDED and WHEN ADDED methods : Expert system variables can directly be accessed in JavaScript for client-side as well as server-side functionality. This helps to implement procedural component to be implemented using scripting languages that are relatively easier and widely used.
- System can run in Debug mode to dump the data and know process status at run-time.
- An expert system can be invoked through URL.
- System Interfaces like Form Designer and Report Designers are used to create HTML input templates and sessions reports to enter, validate data and get formatted output in HTML format.
- Expert system engine can work as Host system for running neural network as well as case-based reasoning systems.

Case-based Reasoning Engine

- Domain independent Web-based CBR systems can be developed. The engine is tightly connected to expert system engine. Expert system can be used to enter query or problem case. Run-time format of case is XML, cases are stored in the database/s.
- Uses combination of rule-base, SQL and nearest neighbour method for retrieval and rule-based adaptation.
- It can address structural as well as conversational CBR thereby supporting wide-range of applications from intelligent help desk to complex decision support. The engine supports taxonomy, hierarchy of CBRs and grouping of features.
- It supports large number of similarity functions and custom functions can be added. It can learn and adjust similarities automatically from the past transaction downloads or examples.

Neural Network

- Support multilayer feed-forward neural network architectures with back-propagation and various variations of that as learning algorithm.
- Tightly connected to database systems, data can be directly accessed from databases and results can be saved to the databases.
- Expert systems can be used to pre-process and post-process the data.

Genetic Algorithm

- Addresses linear and non-linear optimization problems
- Uses value encoding
- Logical expressions can be used while defining logical constraints

SQL-XML Query Engine

- Responses from SQL calls are converted into XML and XML data is converted to SQL requests
- Data is mapped to variables and transformed at the time of retrieval from database/s. Engine can fetch data from multiple databases or update to many databases simultaneously.
- Various access rights can be set to access data based on user, role as well as type of intelligent system accessing data.

Comparing iKen Studio with other tools

Feature	iKen Studio	Expert System	Neural Network	Case-based Reasoning	Data Mining	OLAP
Automated Learning	•••••		•••••	•••	•••••	
Modelling using Lazy Learning	•••••			•••••	•	
Use of Explicit Domain Knowledge	•••••	•••••		••	••	••
Flexibility and Seamless Integration with existing Databases	•••••	•	•	••	••	•••••
Time and Efforts to Develop Intelligent Solutions	•	•••	•••	•••	•••••	•••
Address Various Problem Categories like Classification, Collaborative Filtering etc.	•••••	•••	•••	•••	•••••	•
Maintenance of Applications	•	•••	•	•••	•••••	••
Integration of Models with Business Applications (Deployment)	•••••	•••	••	••	••	•
Use as a an Integrated Application Development Tool	•••••	•••••	•	•••	•	•

••••• High • Low



iKen Solutions Pvt. Ltd.,
SINE, Indian Institute of Technology, Bombay.
Powai, Mumbai - 400 076
www.ikensolutions.com