Case Study
Software Development for Pricer AB

Value adds for client

Apart from product engineering services, our client has leveraged other services to add value to its end clients:

- Professional Services
- Customer support (level 2 and 3)
- Product Development
- Product Maintenance

Why Appulse?

Appulse's relationship with Pricer started with a couple of migration projects and Business Study. Impressed with Appulse's lightweight processes, best practices in product development, maturity, technical capability and delivery excellence, Pricer decided to formalize its relationship with Appulse through a dedicated offshore development center (ODC). Soon, Appulse started a new phase in the relationship by winning projects on the development of next generation products for Pricer. Since the start of relationship in 2003 Appulse has managed more than 30 product releases for different Pricer products.

Testimonial

"Appulse's experienced and excellent team is always willing to deliver and their product releases are robust and client friendly which helps us in strengthening the market and drive sales revenue. Our long term relationship with Appulse has given us advantage in our software product capability and flexibility to develop product for our clients."

-Craig Ibsen, President, Pricer

Pricer opts for product engineering with Appulse to heighten its products.

Success

Appulse's proven technology product development model yields maximum benefits to Pricer in terms of cost savings, improved quality and productivity, world-class talent, and a sustained and strong management relationship with minimal associated risk

The Client

Pricer is the world leader in ESL, (Electronic Shelf Label), communicating price and store information at the shelf edge. Pricer provides the retail industry with electronic price and information systems that significantly increase consumer benefit while optimizing operational efficiency and profitability.

Challenge

With a view to retain its leadership in Market and improve its position in the global arena, Pricer was seeking a long term partner who could help it meet its following objectives:

- Improve margins on its products through cost-effective offshore solutions
- Provide access to world-class talent, robust project management methodologies, tools and framework
- Reduce development cost through improved productivity and mature lightweight processes
- Drastically improve its internal operating efficiency
- Reduce turnaround time for releasing new products in the market with the desired quality levels

The Business Solution

Appulse's strategy for servicing Pricer focuses on some key approaches:

- Appulse has adopted a predominantly offshore model for the ODC, with 95% offshore work. Projects are delivered from multiple locations via a dedicated VPN isolated from the corporate network.
- Key members of the project are still working on the project since last 3 years, aiding to greater knowledge management.
- Diversified service requirements include product development, product re-engineering, conversions & migrations, verification & validation, product localization & globalization.
- A dedicated test engineering group verifies work products to meet Pricer's stringent quality standards, and also is involved in simulating the hardware and proprietary protocols.
- Best practices and methodologies like use of Wiki, Scrum Works and Agile development are adopted to establish a mutually beneficial relationship.
- A 3-monthly business-planning meeting at the management level helps to forecast resource requirements for different skills and platforms.
- Project management by metrics, weekly status reporting, joint review processes and bi-directional feedback mechanisms are adopted to ensure smooth progress of the relationship.

The Benefits

- Significant cost benefits due to maximum offshore leverage
- Increased product engineering capability through access to a resource pool with deep industry and technology experience
- Higher productivity and complete maintenance support with low turnaround time, due to resources being familiar with Pricer products.
- Reduced a resource ramp up time from the initial period of 5 months to 2 months over 1 year time period by internal knowledge management of Pricer products.
- Reduced Pricer overheads and optimal use of their resources on new projects, due to availability of Appulse's skilled engineers.
- Reduced turnaround time for releasing new products, with desired quality levels.
- Created the project knowledge repository which has helped Pricer improve is training to channel partners
- Work in tandem with the hardware design team to fine tune the complete product release map and figure out which feature can be implemented in hardware and which in software.
- Helped Pricer in getting the Carrefour deal (valued over $ 30 Million) by satisfying the RFP requirements in a record time of 10 weeks, and giving them an edge over their competitors

Technical Snapshots

Technical Focus

- Java
- J2EE
- Dot Net
- Visual Basic
- C/C++
- PHP

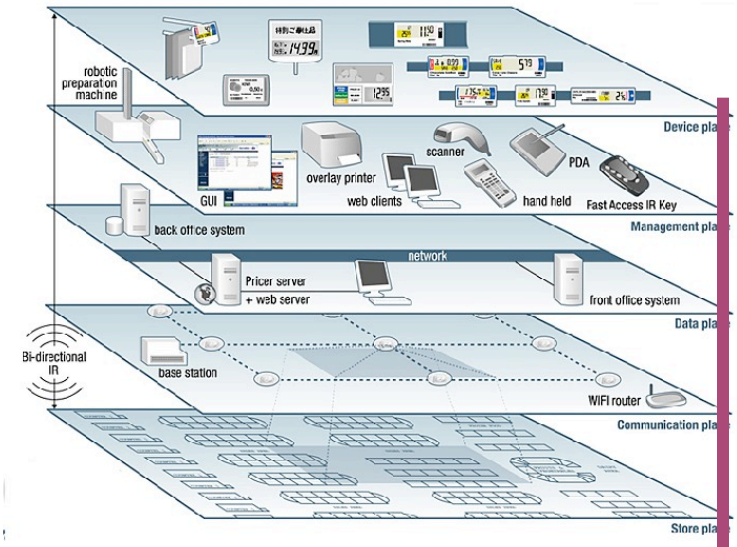
Verticals

- Retail
- CRM/ERP
- Finance

Best Practices

- Industry proven Agile and RUP processes
- Client Involvement at every stage of development
- Regular demo of the prototype before every release
- Proven Project management practices
- High level of team motivation
- Knowledge repository in form on Wiki
- Protection of clients IPR
- Various Engagement models to suit our clients needs

System Design



Base station (BS)

Depending on the store's size and its layout Pricer offers different kind of base stations connecting the transceivers and labels with the store's back-office system and the Pricer Server.

Transceiver (TRX)

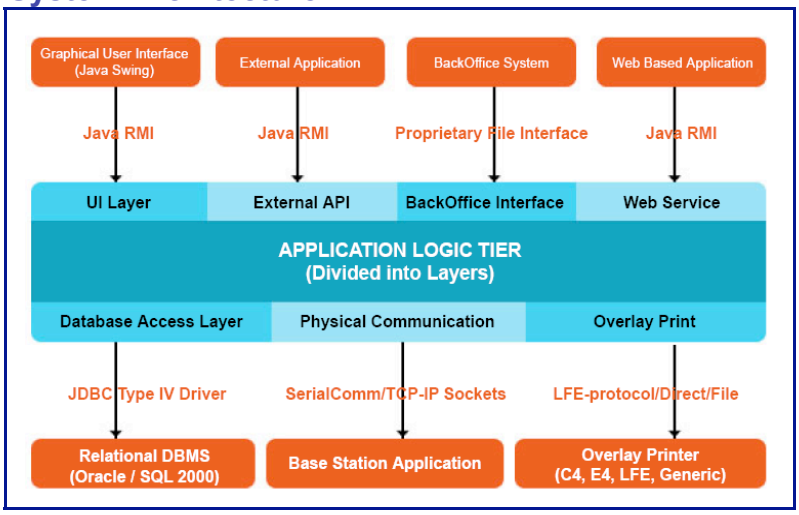
Transceivers are equipped with both receiving and sending diods communicating with the Pricer ESLs with infrared signals. The transceivers each cover an area of 100 square meters in order to maximize their usage and reach.

Key Features

- Frame transmission
- Debugging BS and TRX software
- Identification of subcells
- Basestation and transceiver association
- Locating new and missing devices according to configured algorithm

Technology Solution

System Architecture



Technical Features

- Communication with Family of devices for communication using Product Line Architecture concepts including Base stations, Transceivers, ESLs
- Multiple communication channels using strategy pattern for Serial, Ethernet using different hardware adaptors
- High Configurable system architecture to support customized overlay design, customized item properties, customized store environment properties, custom mapping of ESL fields to item properties for each individual retailer or store chain.
- Multi tier architecture to support central store chain operations in future
- Web based GUIs for operation, administration and configuration using Struts, JSP and Servlets
- Swing based GUI for server status monitoring

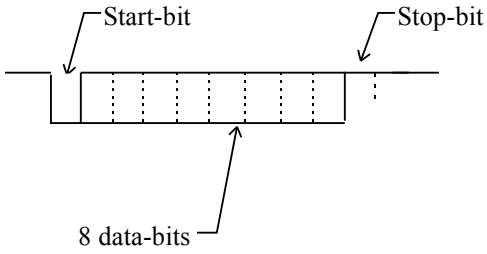
Communication Flow

The serial channel is a full-duplex, request-response communication channel. This means that simultaneous requests and responses can be transmitted on the communication channel. The base station (BS) can hold maximum 5 requests, or max. 256 byte, i.e. no more than five not responded requests are allowed in the BS. The BS sends the response as soon as the request is handled by it.

Protocols

The FEL communication channels contain two RS422 channels for full duplex communication. The communication speed is 62500 baud for asynchronous communication. The transmit channel (from TRXD to TRX) is also used for transmission of PPM modulated IR frames to the TRX'es.

Each serial data package consists of 1 start-bit, 8 data-bits and 1 stop-bit. Parity is not used.



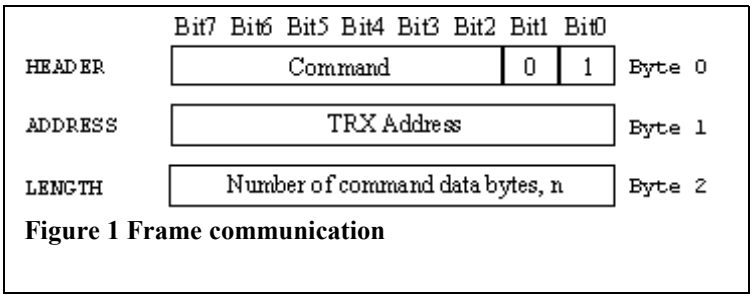


Figure 1 Frame communication

Technical Details

Software Details

OS	Redhat Linux Enterprise Server 9.0 , Redhat Linux 9.0, Windows 2000, Windows NT, HP-UX 11
JVM	Sun Hotspot 2.0, HP JVM
Database	MySQL, Oracle, SQL Server, Mimer
Java	JDBC, RMI, JSP, Struts (MVC), Servlets
Communications	OSI layer based architecture, Asynchronous Object Communication, Java Communication API, UDP and TCP Sockets
Design Patterns	Strategy, Command, Asynchronous Completion Token, Observer, OSI- Layers
Servers	Apache Tomcat

Hardware Details

TRXD	Ethernet based- connected to server via Ethernet LAN. Contains TRXD card and Ethernet card Serial- connected via COM port on server PC. Micro
TRX	TRX 20, 30.
FEL	Cable based LAN which connects TRX with BS.
Ethernet	Frame based computer networking technology
Connectors	Serial port connectors: RS 232, 422.
MOXA	Connects to serial port, and integrates system from serial to Ethernet.
IR Key	To show hidden information to the store officials.