

Web based ERP Application for Food Processing Industry

Case study



Gateway TechnoLabs Pvt. Ltd.

B-81, Corporate House, Judges Bungalow Road, Bodak Dev, Near S.G. Highway,
Ahmedabad – 380 054, India.

Tel: +91 79 26852554/5/6 Fax: +91 79 26858591

E-mail: gateway@gatewaytechnolabs.com

URL: www.gatewaytechnolabs.com

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1. Introduction

The client is in the business of production & sales of Ready-Made Meals. The production takes place in a fully fitted food processing facility, based on procured ingredients and half-products, prepared according to client's proprietary recipes.

The finished products are sold to store chains, whereby outbound logistics (dispatching) is executed by a third party, and takes place directly to the client as well as indirectly through distribution centers.

Thus, the business revenue model is based on Production (the physical conversion "from raw material to finished product") + Client's Proprietary Recipes.

Client procures its Raw Materials & Half-Products from up to 25 suppliers, with different delivery & payment terms. Order Forms are not standardized. These suppliers are categorized into Preferred Supplier and Second-Line Supplier Groups. Orders for Raw Materials & Half-Products are mostly sent by fax.

Client Orders are mostly received through fax, and far fewer times by e-mail or telephone.

2. Overview

Client's staff was using a variety of tools & applications to support their individual & common activities, and thereby the entire client's core business processes. These tools & applications are different in nature (custom-developed vs. off-the-shelf application suites) and are not all interfaced and fully automated. Considering these characteristics against the backdrop of the current production and with a view to client's ambitious growth strategy and near-future business expansion, the application was developed to:

- Take care of client's Food Processing Plant's core business processes
- Replace / interface with several separate tools/applications
- Have functional modules that are consistent with client's business processes
- Centralize all dispersed and/or fragmented business processes & enhance the business process efficiencies
- Decrease the paper-intensity of the core business processes and implement paperless solutions
- Automating the Quality Assurance processes, leading to improved accuracy of CCP parameter sign-offs

3. Requirement

The client was in need of an integrated system which will support clients' food processing plant's core business process. The developed system would enable the client to overcome the following bottlenecks in the present system:

- Repetitive data entry
- Paper-intensive production process support
- Non-automated Quality Assurance procedures
- Time-consuming processes for the creation of Weekly Production Planning, Recipe Creation, Production Preparation Orders, etc. For example: To enter a new recipe in the Main Preparation Schedule the user needs to perform



- approximately 30 actions, including calculations, copy & paste, editing Visual Basic Macros, and creating application buttons.
- No structured automated support of Product Development

4. Benefits

The application development enabled the client to increase competitiveness in their market and to move towards an online automated system supporting its core business processes.

The returned Business Benefits on application development investment should achieve the "3 C's":

Customer Focus: The solution can enhance client's Customer Focus, by increasing the efficiency & reliability of order receipt, confirmation, execution, dispatching, and tracking.

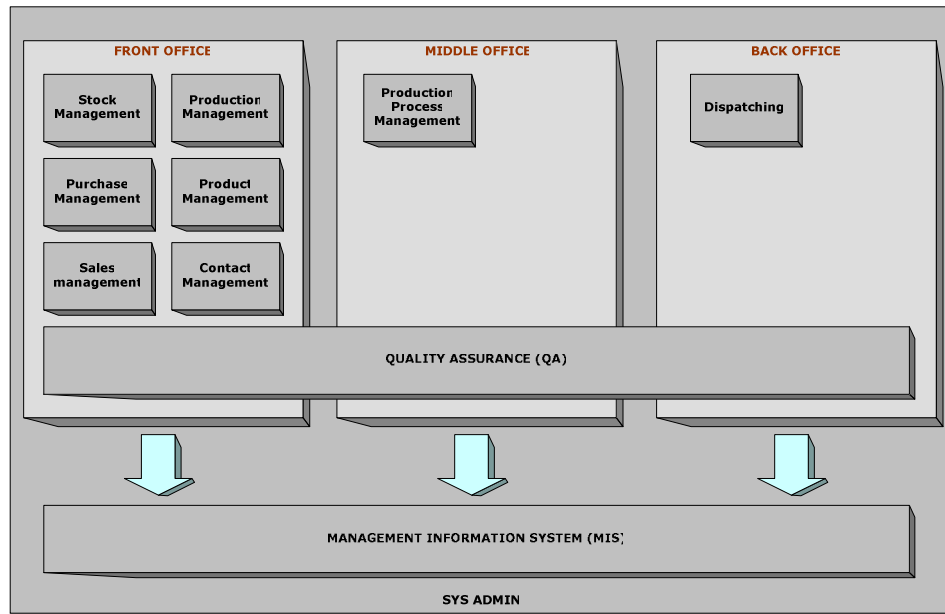
Competitiveness: The solution helped the organization to respond faster to changes in the competitive environment, such as price changes, competitor entry, substitution, etc.

Communication: One of the major criteria for the solution is the ability to cater client's communication needs. Communication will play a major role since client's operations will become increasingly geographically spread. Another benefit from the improved communication is the availability of data to relevant users at the right time, reducing the need for other types of information dispersion & reconciliation. It will also greatly reduce many paper-based and/or paper-supported processes, and thereby provide an additional time saving and cost saving benefit

5. Architecture

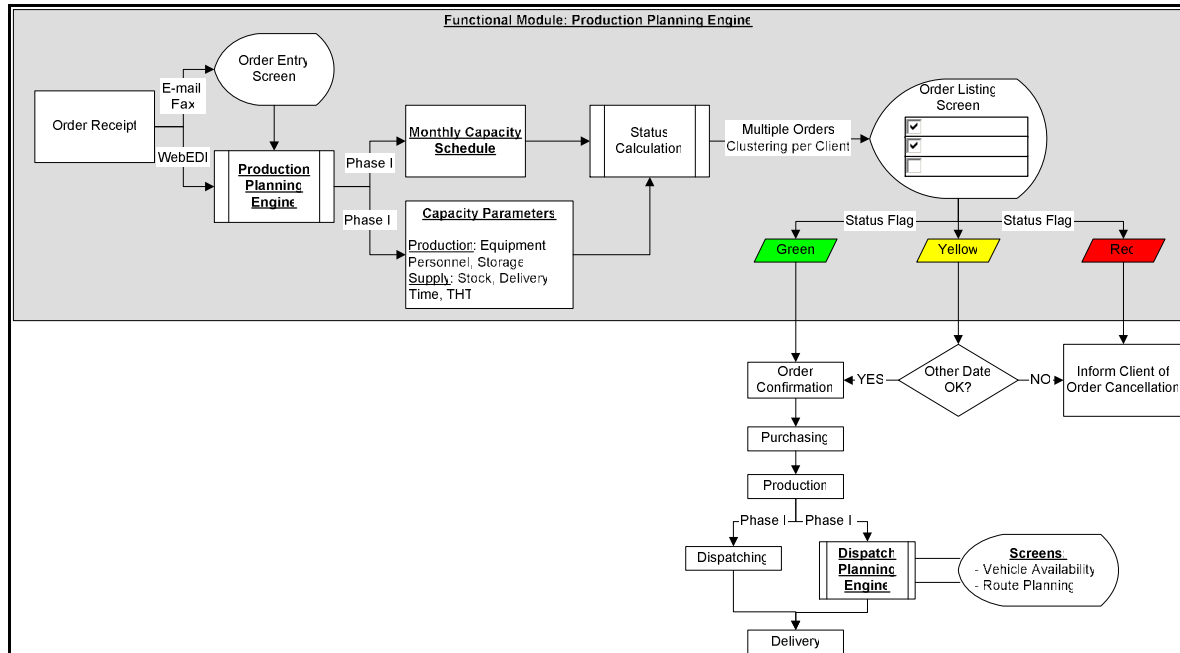
5.1. Functional Model

These functional modules and their related business processes could be outlined as follows:



6. Production Planning Engine

The Production Planning Engine



7. Middle Office

7.1. Production Process Management

The Production Process incorporates two activities that are supported by the application.

7.2. Daily Production Schedule

The PC workstations located in the Production and Packaging department display the DPS, replacing the hard copy versions and thereby eliminating the process of printing & distributing them. Furthermore, changes made to the DPS as production is in progress could be automatically (real-time) displayed.

7.3. CCP Measurement and Sign-Off

This, however, could be supported in future application releases by incorporating mobile technology, whereby the QA Sign-Offs could be done through a PDA interface. Moreover, besides usage of this type of technology for CCP Sign-Off, it could also enable CCP Measurement of certain types i.e. PDA extension for temperature measurement.

8. Back Office

The Back Office activities have been identified as Dispatching alone. The main identified functionalities here are support the Dispatching Process and the creation, storage, amendment of Dispatching Orders.

8.1. Dispatching Process Support & Dispatching Order Support

The application will provide functionality whereby the Dispatch Order is generated automatically on the basis of the Sales Order (or rather: the user feedback on the Sales Order Status as calculated by the Production Planning Engine). Feedback concerning



volume adjustments from Production (Sealing & Packaging, notably) shall be entered in the application, replacing the current separate paper document on which this is written down, thus eliminating the need for copying the adjustments to the Dispatch Order and thereby the risk of erroneous entry.

9. Quality Assurance

The QA Module and its sub-modules are linked to all other modules in function of necessity and relevance.

9.1. Critical Control Point Management

Within the QA processes, there are Critical Control Points (CCP) being checked at various stages in the production and other processes. There are approximately 15 CCP per product group. The CCP are categorized into High Care CCP and Low Care CCP.

- High Care CCP
- Low Care CCP

9.2. PVA Management

Besides the CCP, there are also Points of Attention. These are not classified as CCP due to lesser importance/impact in terms of QA. There are about 10 PVA per product group.

9.3. Production Process Quality Management

QA is responsible for assuring that the quality procedures in the production process are adhered to. With a view to this responsibility, it has the sole authority to set & change the procedures for measuring of and signing off on Critical Control Points.

- CCP Parameter Measurement
- CCP sign-off

9.4. QA Parameters Management

The application has the functionality enabling Quality Assurance to set & manage the QA Parameters that underlie client's business processes.

9.5. Sample Management

Between the Production and Dispatching of goods, samples are taken of every batch to be checked by QA. These samples will be entered into the application in the Sample Input screen.

When a sample is QA approved, the corresponding batch is released for further processing (sealing/packaging & dispatch/stock, whichever is applicable). The Sample Management functionality will also apply to samples taken in the NPD process.

10. Supplier Management

Supplier Rating is done at set time intervals or at user-defined moments. It is carried out by the system on the following parameters:

- Quality (QA)



- Cost
- Quantity
- Delivery

The system has the option to incorporate other parameters as well.

Supplier Performance is calculated and depending on the performance ratings specific actions can be taken:

- Retain
- Educate
- Warn
- Remove

11. Report Generator

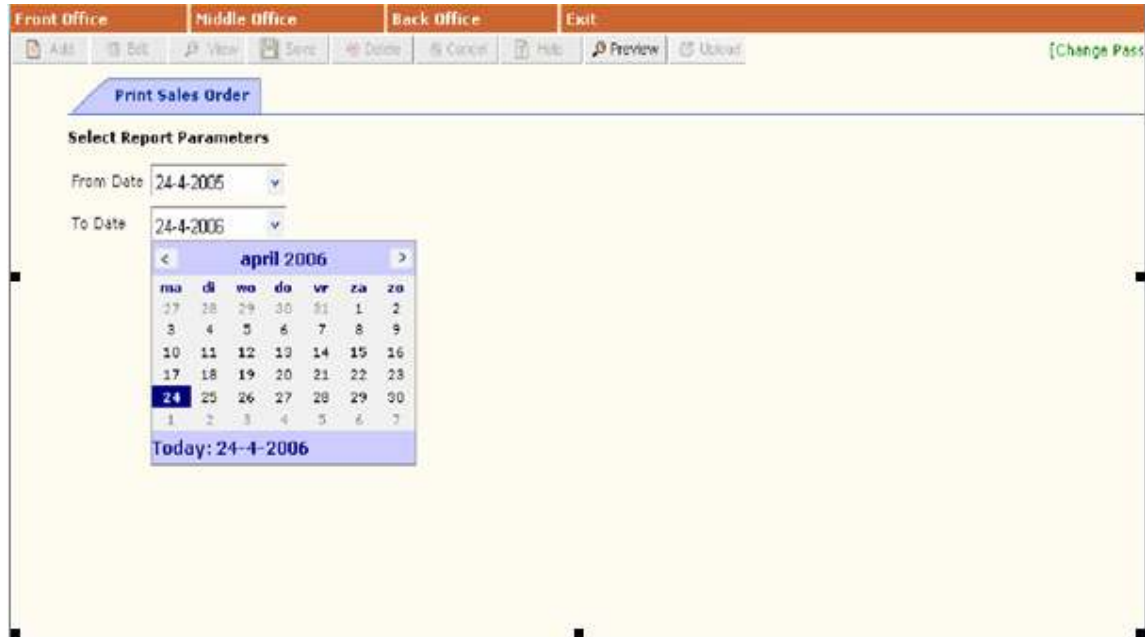
The system is designed in such a way to address all the reporting needs of the management.

There are standard reports and specific reports. Standard reports are defined as being fixed of content i.e. monthly sales report, End-of-Day open PO, etc. Specific reports are defined as having one or more user-definable parameter values that can be used to determine/manipulate the data retrieved from the system i.e. sales from <begin date> to <end date>, and often are based on more advanced calculation formulae i.e. average sales of a certain dish for a certain (internal) client for a certain period.

Examples of reporting areas are:

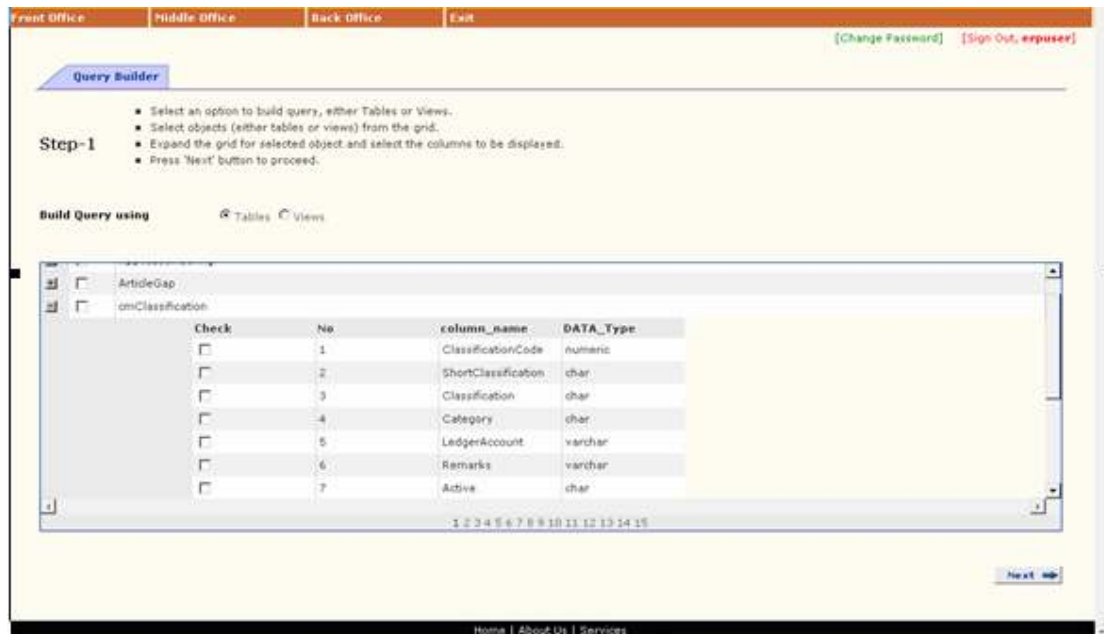
- Sales
- Purchase
- Inventory/stock
- Production
- QA

11.1. Report Generator Screenshot



11.2. User defined Query/Report Screenshot

The system is designed in such a way that user can defined query base on his or management needs and the results are allowed to export in various format like Excel, CSV or XML format.





Front Office | Middle Office | Back Office | Exit

[Change Password] [Sign Out, erpuser]

Query Builder

Step-2

- Relationships table displays all relationships among the selected tables/views. Select the relationship if you want to display related records only.
- Check the group by check box if you want to group the records. Select Group Functions from the Group By Grid.
- Select order by field.
- Press 'Next' button to proceed.

Relationships

Sel.	Child Table	Parent Table	Parent Table Column	Child Table Column	Unique Constraint Name	Constraint Name
------	-------------	--------------	---------------------	--------------------	------------------------	-----------------

Group by

Group-By Column	Group
[omCustomers].[CustomerCode]	None
[omCustomers].[Name]	None
[omCustomers].[CustomerClassification]	None
[omCustomers].[BankAccount]	None

Order By

Order-By Column	Sort
[omCustomers].[CustomerCode]	None
[omCustomers].[Name]	None
[omCustomers].[CustomerClassification]	None
[omCustomers].[BankAccount]	None

[Back] [Next]

Home | About Us | Services

Front Office | Middle Office | Back Office | Exit

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Query Builder

Step-3

- You can specify joins among the tables/views.
- Click 'Add' button to add a new join.
- Fill all the details in table.
- Press 'Build' to build the query.

Joins

Select	Table From	Column From	Operator	Table To	Column To	Value List
--------	------------	-------------	----------	----------	-----------	------------

[Add Join] [Build]

[Back]

Home | About Us | Services



Front Office Middle Office Back Office Exit

[Change Password] [Sign Out, erpuuser]

Query Builder

- You can use different options for generated query text.
- You can execute the query from this form itself or you can export the data to different format.
- You can save the query text to database table. Later, you can load it using Load Query form.

Step-4

Query Text

```
Select [cmCustomers].[CustomerCode],[cmCustomers].[Name],  
[cmCustomers].[CustomerClassification],[cmCustomers].[BankAccount],  
[cmCustomers].[BankName],[cmCustomers].[CreditLimit],  
[cmCustomers].[Notes] From cmcustomers where 1 =1 Group By  
[cmCustomers].[CustomerCode],[cmCustomers].[Name],  
[cmCustomers].[CustomerClassification],[cmCustomers].  
[BankAccount],[cmCustomers].[BankName],[cmCustomers].  
[CreditLimit],[cmCustomers].[Notes]
```

Copy to Clipboard Param Execute Save Query

Export Query

Export Format: Excel
Column Delimiter: Comma Separated

Back

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Front Office Middle Office Back Office Exit

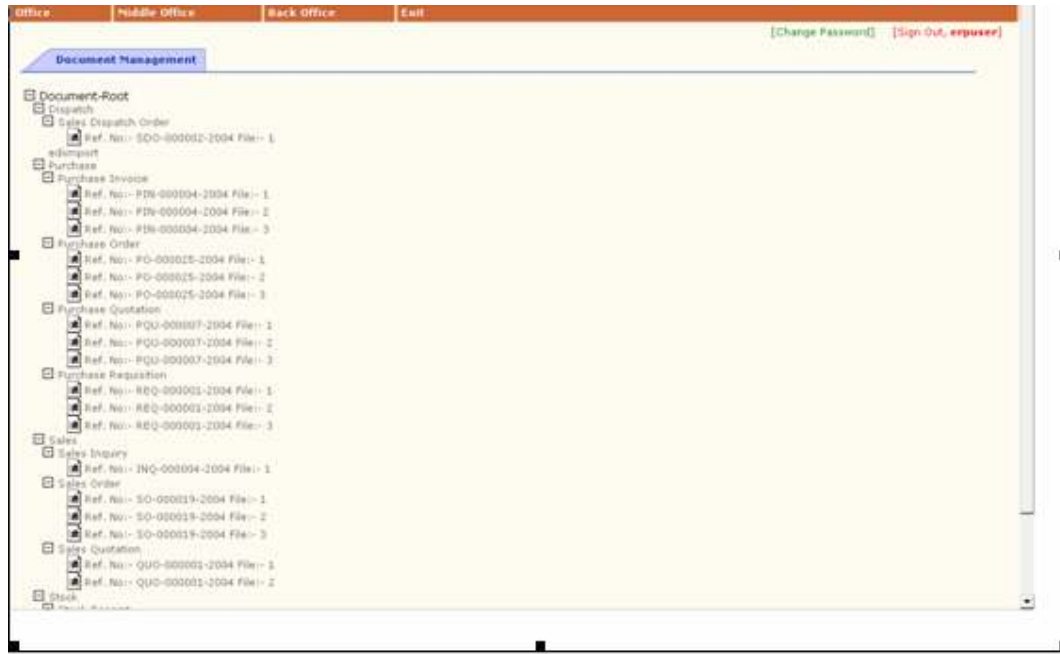
[Change Password] [Sign Out, erpuuser]

Document Management

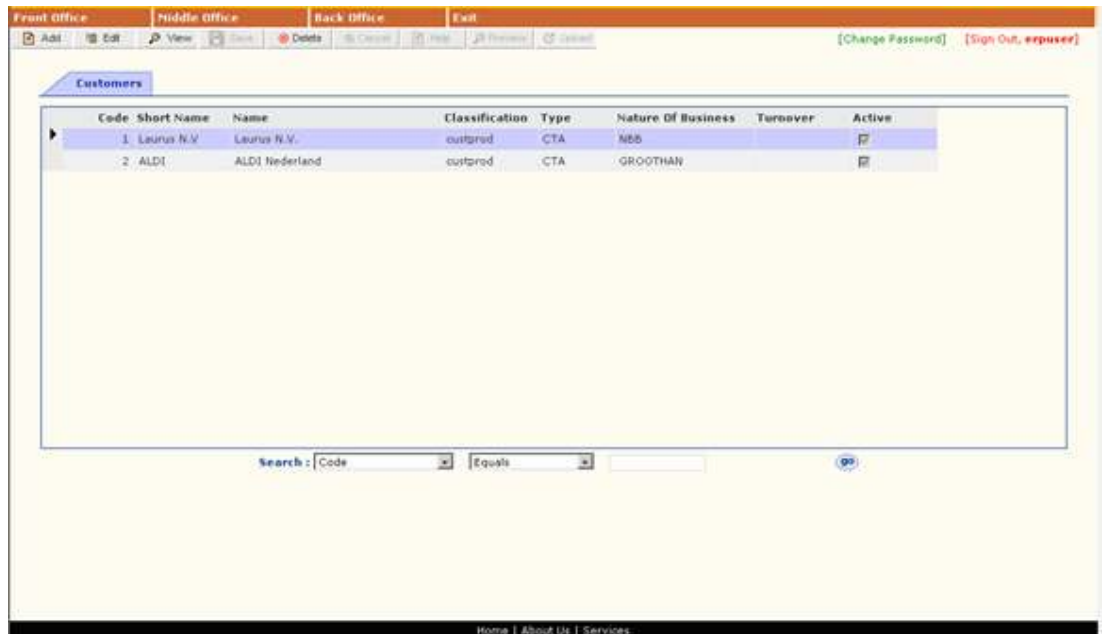
- Document-Root
 - Dispatch
 - Sales Dispatch Order
 - Ref. No:- SDO-00002-2004 File:- 1
 - edimroot
 - Purchase
 - Purchase Invoice
 - Ref. No:- PIN-00004-2004 File:- 1
 - Ref. No:- PIN-00004-2004 File:- 2
 - Ref. No:- PIN-00004-2004 File:- 3
 - Purchase Order
 - Ref. No:- PO-00025-2004 File:- 1
 - Ref. No:- PO-00025-2004 File:- 2
 - Ref. No:- PO-00025-2004 File:- 3
 - Purchase Quotation
 - Ref. No:- PQU-00007-2004 File:- 1
 - Ref. No:- PQU-00007-2004 File:- 2
 - Ref. No:- PQU-00007-2004 File:- 3
 - Purchase Requisition
 - Ref. No:- REQ-00001-2004 File:- 1
 - Ref. No:- REQ-00001-2004 File:- 2
 - Ref. No:- REQ-00001-2004 File:- 3
 - Sales
 - Sales Inquiry
 - Ref. No:- INQ-00004-2004 File:- 1
 - Sales Order
 - Ref. No:- SO-00019-2004 File:- 1
 - Ref. No:- SO-00019-2004 File:- 2
 - Ref. No:- SO-00019-2004 File:- 3
 - Sales Quotation



11.3. Client Related Document Management – Screen Shot



11.4. Alphabetical Client Listing





11.5. Client Profile Information

The screenshot shows a web-based form for client profile information. The form is divided into several sections: Customer Information, Contact Details, Price Lists, and Articles. The Customer Information section includes fields for Code, Short Name, Name, Customer Account/EAN, and Active status. The Contact Details section includes fields for Customer Address, Bill Address, and Ship Address. The Price Lists section includes fields for Nature of Business, Turnover, Representative, Classification, Type, and Default Price List. The Articles section includes fields for Account No., Bank Name, Bank Location, Credit Limit, VAT Number, Chamber of Commerce, Verification Date, and Notes. The form also has a History button and a footer with Home | About Us | Services.

11.6. Client Profile Information, Key Relationships

The screenshot shows a table displaying key relationships for a client profile. The table has columns for Delete, Greeting, Contact Person, Area, Phone, Mobile, Email, and Notes. The data row shows a contact person named Mr. Van Heerebeek. The table also has a History button and a footer with Home | About Us | Services.

Delete	Greeting	Contact Person	Area	Phone	Mobile	Email	Notes
<input type="checkbox"/>	Mr.	Van Heerebeek					



12. Technical Model

The application has interface with several 3rd Party applications and be ready for (future) inclusion of extended functionalities concerning web technology (i.e. Web-EDI), e-mail (i.e. goods ordering), and process control (i.e. PDA interface for QA sign-off during production).

Notably, the application has the Import/Export functionality with UNIT4/Globe to facilitate Contact Management between the application and those 3rd party applications.

13. Technology

MS SQL Server, C#, .Net Expertise

14. Project Duration

5 Months

15. Team Size

6 Professionals