

National Language Support(NLS) For Plant Applications



Guides :
Ramesh Ellapukurthi
(GE-IIC)
Dr. Alok Singh

By
R.Vamsi Krishna
08MCMT19
M-Tech(CS)
University Of Hyderabad



imagination at work

Contents:-

- Introduction.
- Problem Definition & Motivation.
- Existing System.
- Problems with the existing system.
- Proposed System.
- Results
- Conclusion & Future work.
- References.

Introduction:



imagination at work

Proficiency Plant Apps:-

Plant Applications is a suite of powerful *application modules* that allows manufacturers to make *business sense* out of plant data in *real-time*.

Application Modules:

- Efficiency Management
- Quality Management
- Production Management
- Batch Management



Efficiency Management :-

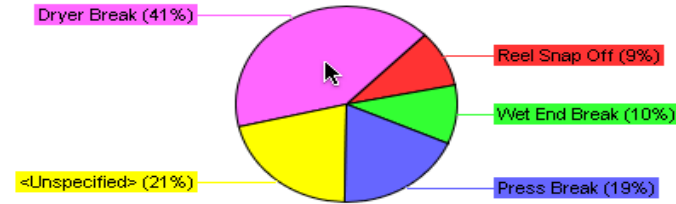
- Track and monitor production and your manufacturing efficiency.
- Analyze production history and solve root cause problems.
- Support real-time decision-making with web-based dashboards and reports.
- Optimize Utilization of plant equipment, people, and materials.
- Identify and Improve areas that are causing operational inefficiencies.
- Make data-driven decisions on best practices, capital expenditures, and process improvement initiatives.

Efficiency example

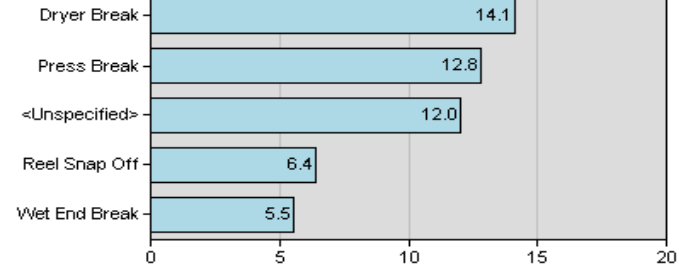
Plant Applications Web Server

Fault Analysis

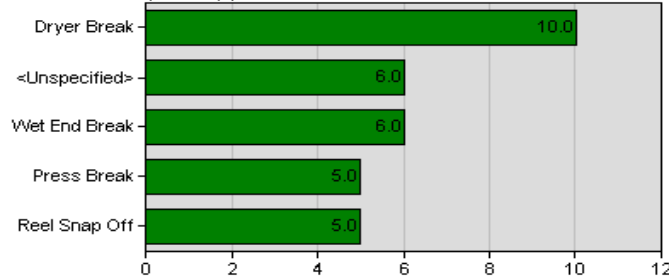
Fault (%)



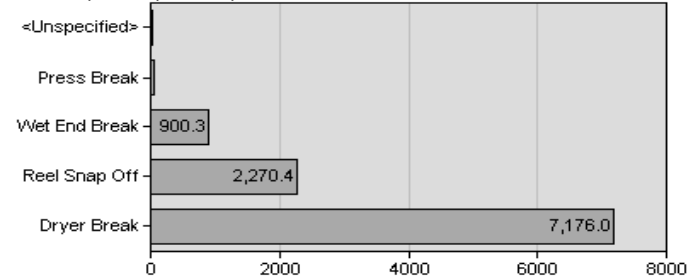
MTTR By Fault (Minutes)



Occurrences By Fault (#)



MTBF By Fault (Minutes)

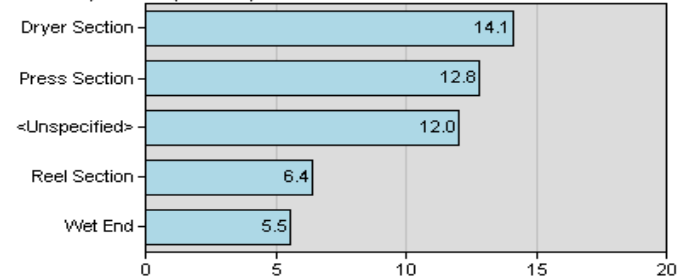


Cause Analysis

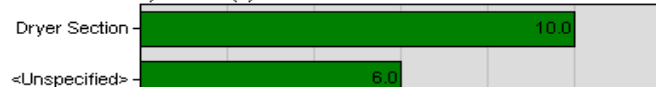
Cause (%)



MTTR By Cause (Minutes)



Occurrences By Cause (#)



MTBF By Cause (Minutes)



Quality Management :-

- Control your product quality and improve your process capability.
- Lower the cost of quality.
- Optimize your processes .
- Increase manufacturing agility

Production Management :-

- Control your Production Schedule and Optimize Material Flow in real-time
- Provide Comprehensive Product Genealogy Tracking
- Support real-time decision-making with web-based dashboards and reports.
- Improve Agility and Predictability Of Production Processes
- Lower Manufacturing Costs

Production example

Microsoft Internet Explorer provided by GE Industrial Systems

Event Genealogy - Microsoft Internet Explorer provided by GE Industrial Systems

Address: http://vmware1/Apps/Applications/EventViewer/EventDetail.aspx?Id=94055

Proficy™ Lots FV4H1106:8:2
 On PK1 Work Cell
 Created: 11/11/2004 9:10:50 AM

Event Information

Status	Complete
Product	<None>
Process Order	PD10412 (Complete)
Start Time	10/29/2004 5:18:00 PM
End Time	11/2/2004 8:20:00 AM
Initial Quantity	57442
Final Quantity	57442

Waste Summary

Time	Fault	Location
11/2/2004 8:21:16 AM	<Unspecified>	PK1 Work Cell
11/2/2004 8:21:38 AM	<Unspecified>	PK1 Work Cell

Downtime Summary

Start	End	Fault	Loca
10/29/2004 5:30:00 PM	11/1/2004 9:34:00 AM	Conveyor 1 - Infeed	PK1 C
11/1/2004 9:34:00 AM	11/1/2004 9:48:00 AM	Washer - Infeed Standby	PK1 Y
11/1/2004 10:02:00 AM	11/1/2004 10:16:00 AM	Conveyor 3 - PLC Problem	PK1 C
11/1/2004 10:30:00 AM	11/1/2004 10:44:00 AM	Trimmer 1 - PLC Problem	PK1 Y
11/1/2004 10:58:00 AM	11/1/2004 11:12:00 AM	Conveyor 3 - Discharge	PK1 C
11/1/2004 11:26:00 AM	11/2/2004 7:56:00 AM	Trimmer 1 - PLC Problem	PK1 Y
11/2/2004 8:10:00 AM	11/2/2004 8:20:00 AM	Washer - Infeed Standby	PK1 Y

Input Components

Item	Time	Product	Unit	Amount
BK4H1218	11/2/2004 8:20:00 AM	<None>	Bottling Filler 1	0 Lbs
FV4H1106:8	8/18/2004 8:02:00 AM	<None>	Bottling Filler 1	0 Lbs

Event Genealogy - Microsoft Internet Explorer provided by GE Industrial Systems

Beer Batch End : BK4H1218

Inputs: Direct Beer Batch End: BK4H1218 Outputs: Direct

```

    graph LR
      subgraph Inputs
        I1[1] --> B1[BK4H1218 Ipatch Ale 8 BB1 Brite Beer Tank 0 0 0]
        I2[1] --> B2[MT4H1809 Stout 8 BB1 Brite Beer Tank 0 0 0]
      end
      B1 --> BF[BK4H1218 <None> Bottling Filler 1 0 0 0]
      B2 --> BF
      BF --> O1[FV4H1106:8:2 <None> PK1 Work Cell 0 0 0]
      BF --> O2[BK4H1218 PK310001 PK1 Work Cell 0 0 0]
    
```

Powered By Plant Applications®

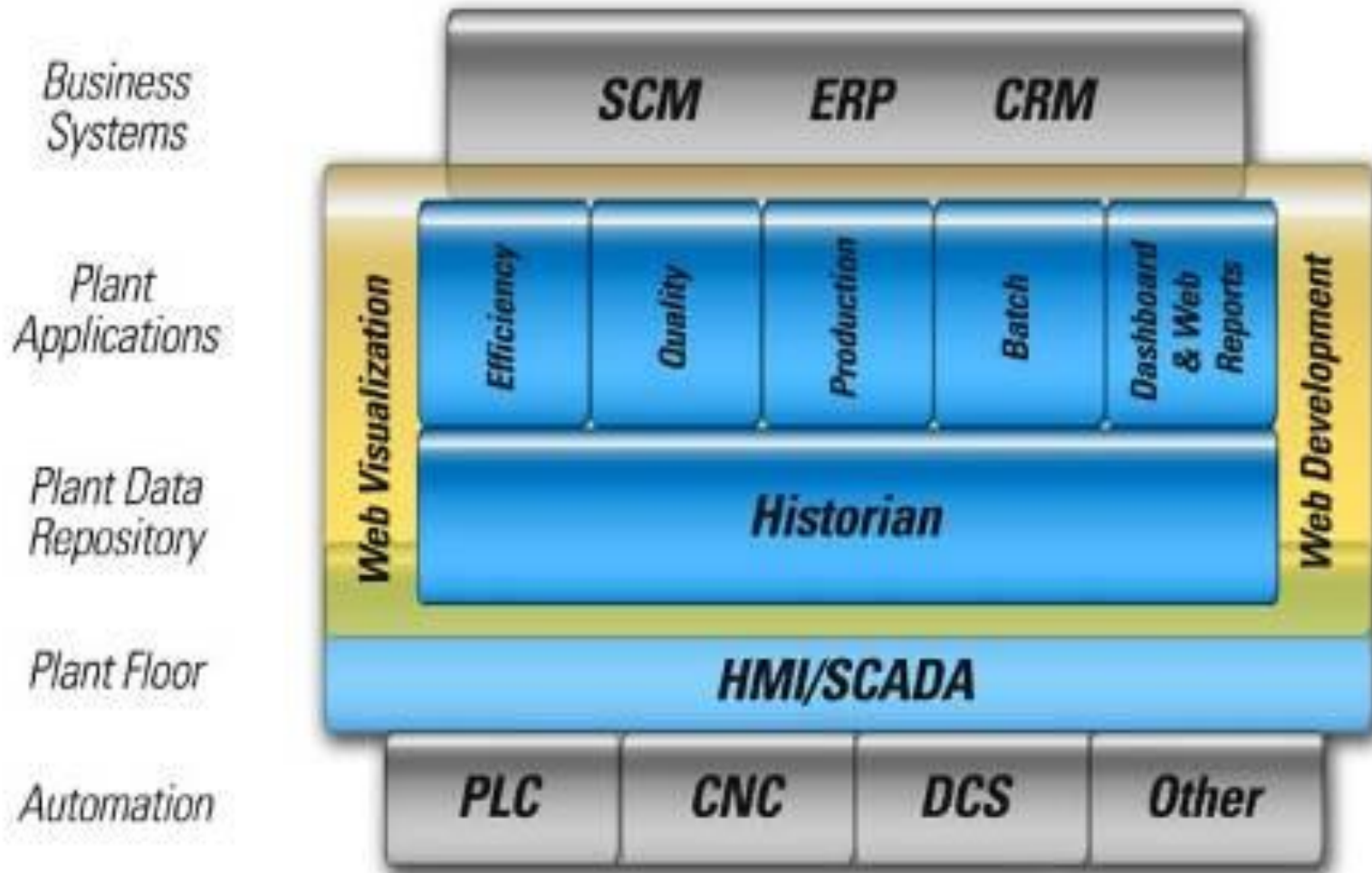
Copyright © GE Fanuc International Inc.

Nov 9	N	D	PK020601	BB24-1101:1	Complete	11/8/2004 16:39	11/10/2004 06:25	12.00	1.36%	00:11:00	00:26:00
-------	---	---	----------	-------------	----------	-----------------	------------------	-------	-------	----------	----------

GE /



Proficiency Plant Apps :-



Problem Definition and Motivation:



imagination at work

Problem Definition and Motivation:-

- Plant Applications has wide range of users across world, it is required that user interface of this product should be NLS. Plant Applications needs to support 14 international languages as part of NLS.
- Current project mainly focus on Reporting module. The report server, which is commonly used for viewing different types of reports, should have NLS.
- Motivation for this project is the increase in demand for the Plant Applications in various countries of different languages. So it has to support minimum of 14 languages.

Existing System:



imagination at work

Translations in Web Parts and Web Apps:-

- The prompts which are visible in the dialog boxes and final reports are translated in two locations.
- One is at the design stage or rendering stage of the dialog or report in which we can translate the strings.
- The other is we retrieve the strings and just print them in the dialog box or the report. Here, the obtained strings from the database should be translated. In this case the translations are done in the stored procedures.

OEE nach Einheiten

Einheiten | Startzeit and Endzeit | **Spalten** | Fertigstellen
< Zurück Weiter >>

Seite 3 von 4

Verfügbare Spalten

- Ausführungszeit
- Ladezeit
- Verfügbare Rate %
- OEE %
- Alarme

Translated at rendering stage

Retrieved from database

Sichtbare Spalten

- Einheit
- Nettoproduktion
- Tatsächliche Geschwindigkeit
- Ideale Produktion
- Leistungsrate %
- Ausschuss
- Qualitätsrate %
- Leistungszeit



Nichtproduktivzeit enthalten

Einheitenname	Nettoproduktion	Tatsächliche Geschwindigkeit	Ideale Produktion	Leistungsrate %	Ausschuss	Qualitätsrate %	Leistungszeit
OEE Event	2.251.172,0 Kg	3521,33 Kg/Std.	1.229.291,0 Kg	100,0%	2.084,83 Kg	99,9%	14:35:21
OEE Time	7.455,0 Einheiten	20,65 Einheiten/Std.	13.019,0 Einheiten	100,0%	5.564,0 Einheiten	57,3%	1 00:09:00
GEN Unit	2.000.546,0 Einheiten	0,00 Einheiten/Min.	2.000.546,0 Einheiten	100,0%	0,0 Einheiten	100,0%	00:00:00
Übersicht	4.266.822,0 Einheiten	36,51 Einheiten/Min.	3.242.856,0 Einheiten	100,0%	7.648,83 Einheiten	99,8%	1 14:44:20

Zeit: 26.03.2010 07:00:00 zu 25.04.2010 07:00:00

Retrieved from database

Translated at rendering stage

Translations in Web Parts:-

- In the existing system at the time of configuring the plant we have to assign the language number to the user “DASHBOARD”.
- This will create an entry in user_parameters table. In order to change the language of display we need to update this table or change the language property of the user using administrator.
- Based on this each and every word in the web parts are translated.

Translations in Web Apps:-

- In the existing system, at the time of configuring the plant we have to create the users and assign the language number to the users.
- This will create entries in user_parameters table. In order to change the language of display we need to update this table or change the language property of the user using administrator.
- In order to open the report server it asks the user name and the password. Using this user name it retrieves the language number from the database. Based on this each and every word in the web parts are translated.

Translations in ASP Reports:-

- In the existing system, all the strings are translated based on the language number of the user who created the report.
- First based on the report id of the requested report, the id of the owner who created the report was retrieved from report_definitions table.
- Then the language number of the corresponding user is retrieved from user_parameters table.
- Based on the language number all the strings are translated.

Problems with the existing system:



imagination at work

Problems with the existing system:-

- If the user who logged in has a different language id than that of the dashboard user then web parts and web apps can be viewed in a different language which is not preferred.
- It is difficult to update the user parameters every time if we want to view reports in different languages.
- One can't view reports (web parts) in different languages at same time using different machines.
- The same ASP Report, which is already saved, is displayed in different language if we change the language of the owner of that specific report.

Proposed System:



imagination at work

Translations in Web Parts and Web Apps:-

- As the user logged into the report server the request object is created. With the first preferred language in request object, we change the current culture to that specific culture.
- With the locale id (LCID) of that particular culture, we find the language id using the table “languages”.
- Then we will make an entry in “client_connections” using insertLCID stored procedure. It creates an entry in the table with the attributes language id and the machine name from which the request has arrived.
- After this we establish a connection to the database using “register_connection” stored procedure. It creates an entry in the user_connections table with the attributes user id, client machines’ name, user connection id and the language id of that particular machine.

Translations in Web Parts:-

- In the rendering stage in order to translate a string a stored procedure “get_translation” is used which in turn uses a function named fndb_translate. This function retrieves the language id from user_connections table based on the connection id. Then it retrieves the corresponding string from language_data table with specific prompt_number.
- In the stored procedures if we want to translate strings, we use fndb_translate function. This function retrieves the language id from user_connections table based on the connection id. Based on the retrieved language number the corresponding string is retrieved from language_data table by using the prompt_number of that particular string.

Translations in Web Apps:-

- In the Web Apps at the rendering stage of the dialog in order to translate the strings first it identifies the language number of the client machine using GetUserInformation or GetLanguageIdUsingLCID stored procedures. These stored procedures retrieve the language number from user_connections table. Then it caches set of strings based on the prompt_number of the first string which has to be translated.
- In the stored procedures if we want to translate strings, same old fndb_translate function is used.

Translations in ASP Reports:-

- Here all the strings are translated based on the language number of the client machine at the time of creation of the report.
- An extra attribute is added to report_definitions table which is the language number at the time of creation.
- Then based on the report id of the requested report, the language id of the client machine at the time of creation was retrieved from report_definitions table.
- Based on the language number all the strings are translated.

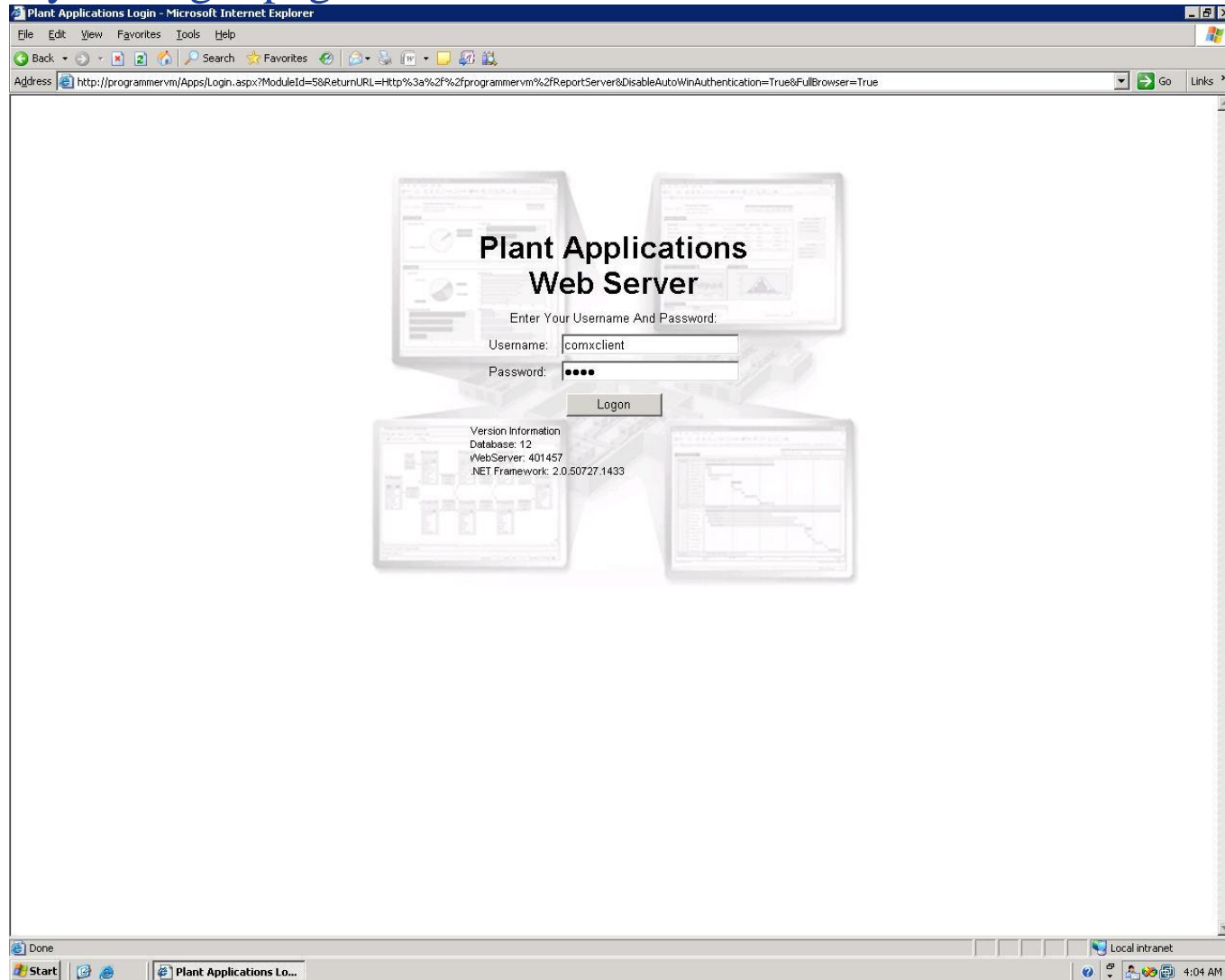
Results:



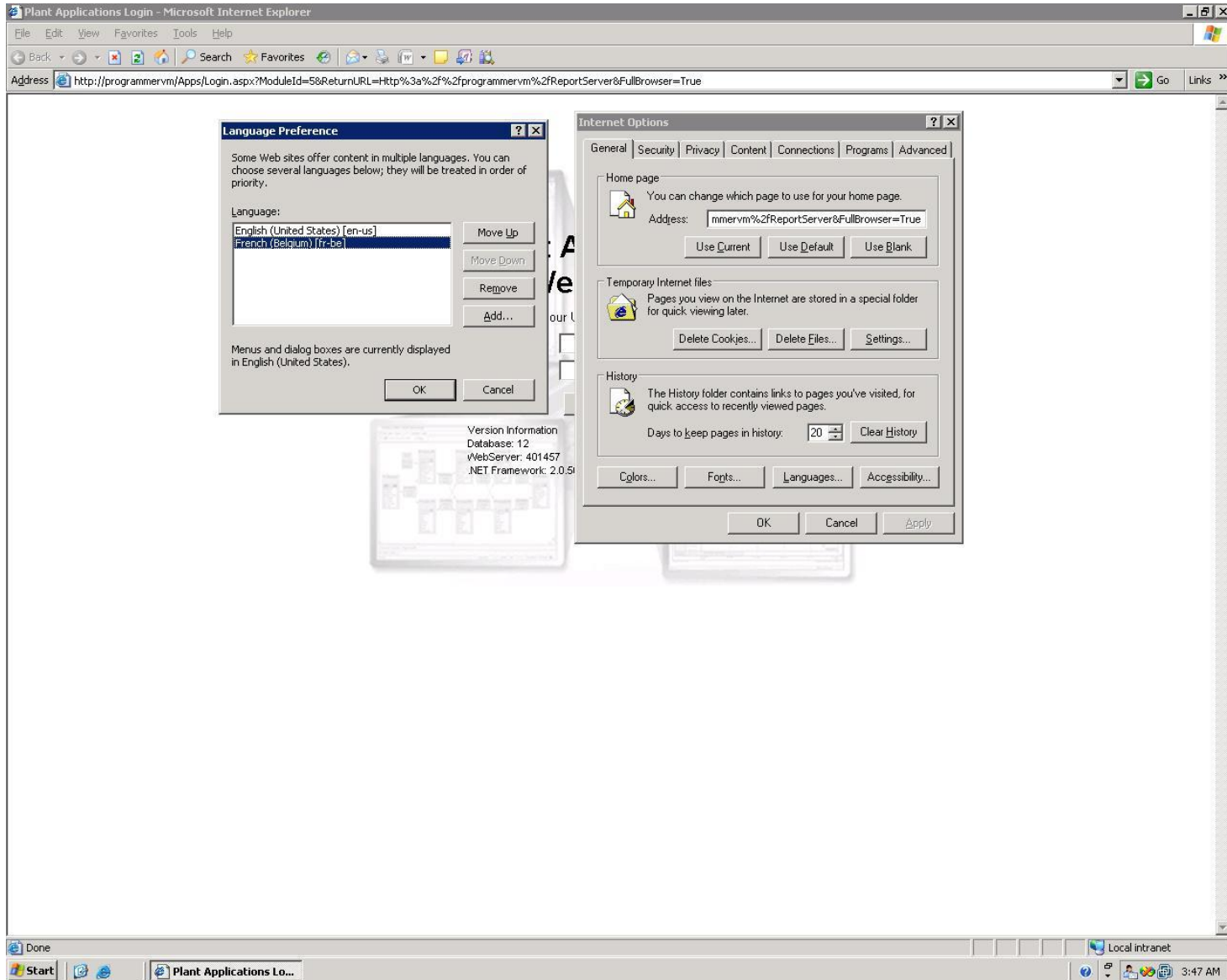
imagination at work

Results:-

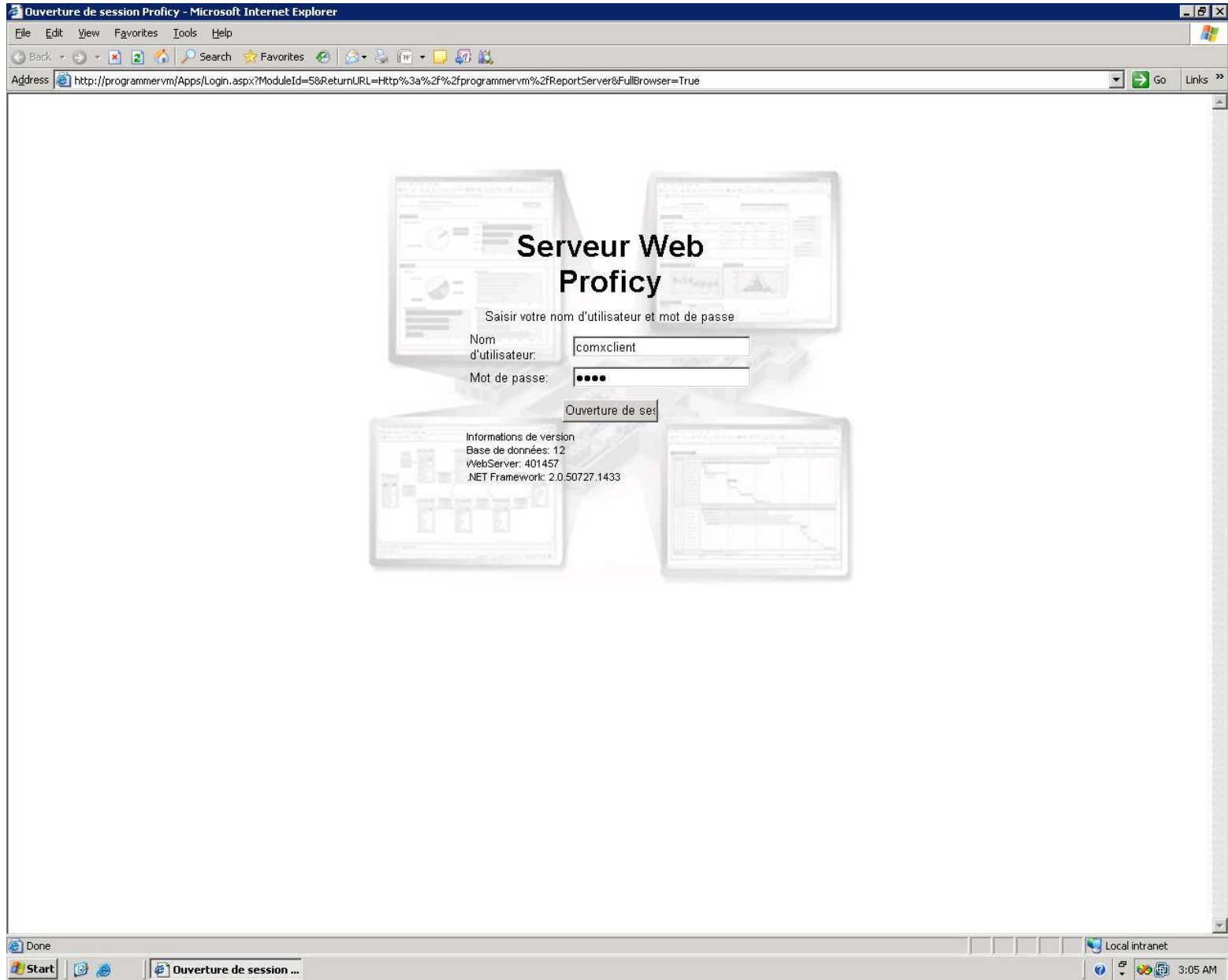
- Initially the login page looks like this.



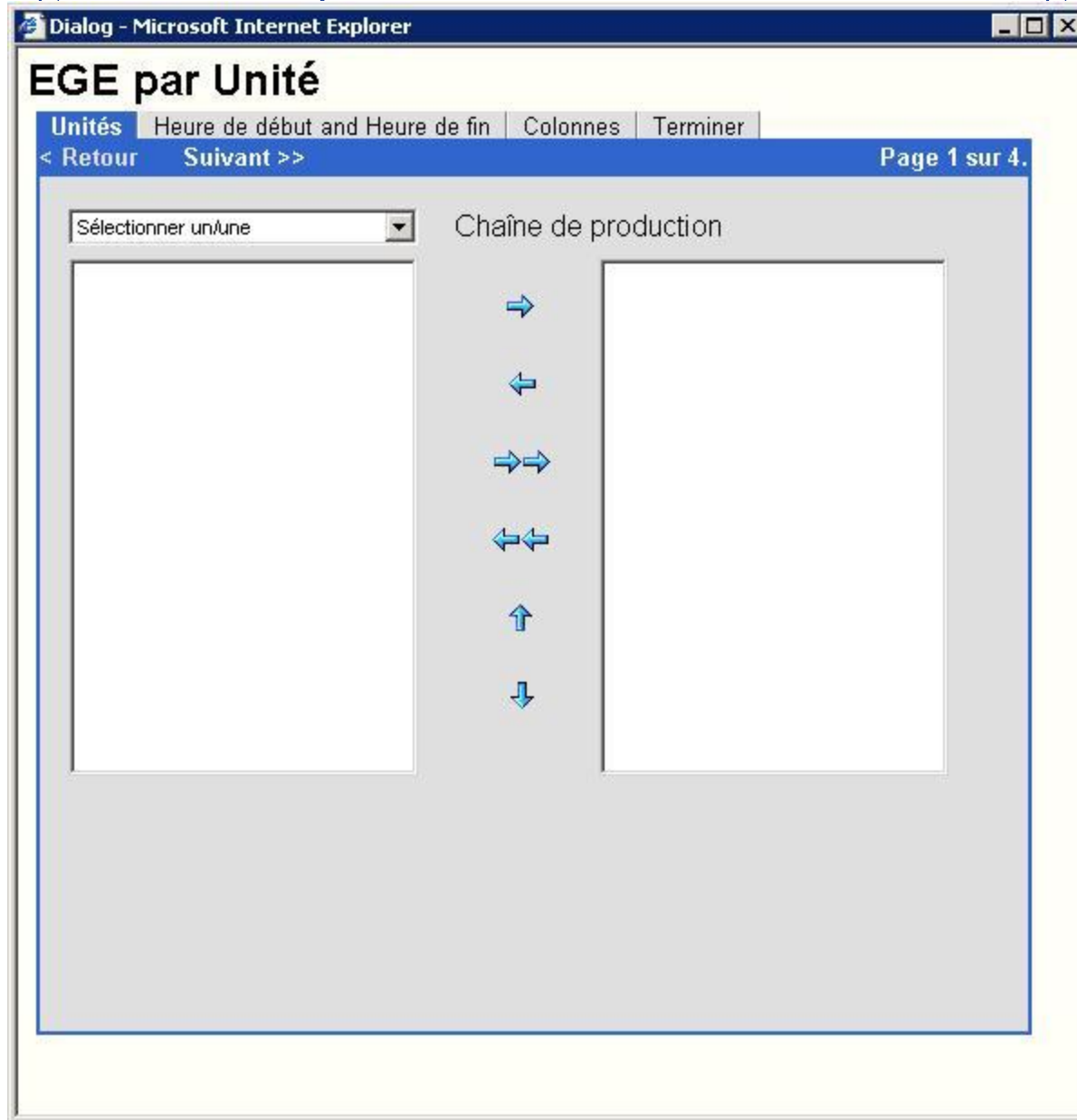
- Change the language of the browser.



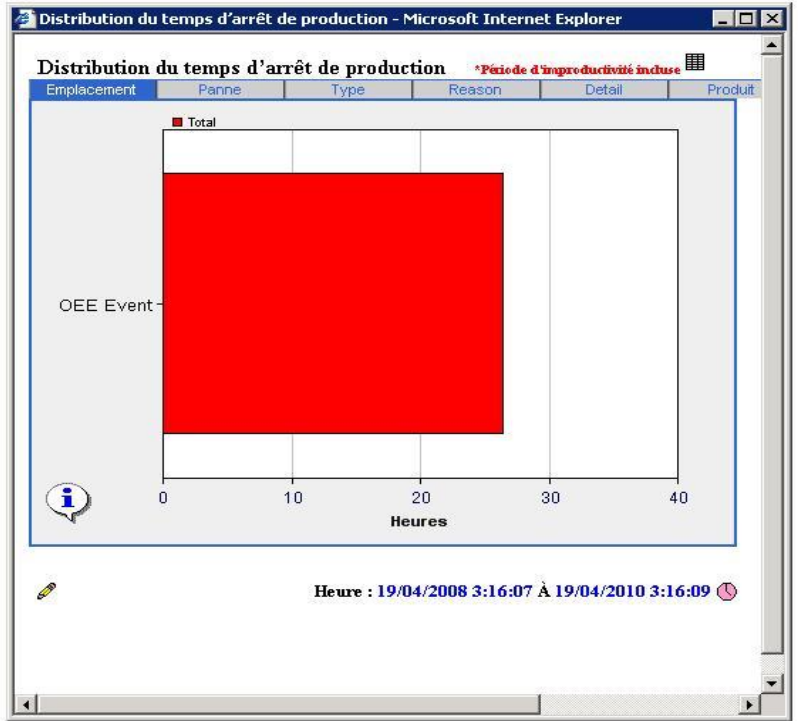
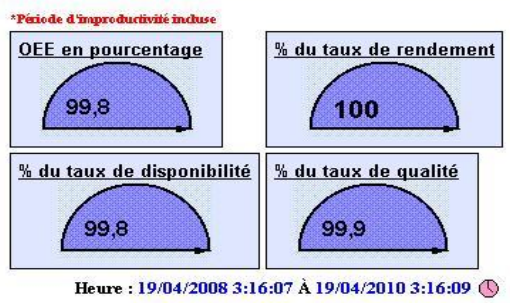
- Then the login page converts to corresponding language.



- The dialog boxes and reports are converted to the selected language.



- Default (ComXClient)
 - Administration
 - WebParts
 - OEE By Units
 - Quality Distribution
 - Efficiency Statistics By Unit
 - Operating Downtime Distribution
 - Performance Distribution
 - Inventory Distribution Charts By U
 - Production Distribution Charts By
 - Waste Top N Charts By Units
 - Waste Distribution Charts By Unit
 - Alarm List By Units
 - Production Event Alarms By Unit
 - Downtime Top N Charts By Units
 - Alarm List By Variables
 - Quality Statistics By Variable
 - Production Event Status List By U
 - Alarm Count By Variables
 - Production Statistics By Lines
 - Process Order (Active) List By Lin
 - Product Statistics By Units
 - Alarm Details By Production Even
 - Overview Statistics By Path
 - Downtime Distribution Charts By U
 - Batch Analysis
 - ASP Reports



Plant Applications Web Server - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites

Address http://programmervm/ReportServer/Viewer/ Go Links

Plant Applications Web Server

Analyse de l'événement

Sélectionner heure de début/fin | Unités | **Type d'événement** | Variables | Cause | Action | Produits | Options de l'analyse d'événements | Options | Terminer

<< Retour Suivant >> Page 3 de 10.

Description

- Alarme
- Temps d'arrêt
- Non-Productive Time
- Perte

Unité de production sélectionnée: OEE Event
Événements supplémentaires affichés
Événements filtrés par variable sélectionnée

Conclusion & Future Work:



imagination at work

Conclusion:-

- National language support for the reporting module in the Plant Applications has implemented successfully. All types of reports are translating based on the language of the browser.

Future Work:-

- In the navigation tree of the report server the names of the web parts are not getting translated. These names have to be translated.

References:



imagination at work

References :-

- Proficy Plant Applications Fundamentals – Technical Training Manual
- Programming C# 3.0 Jessy Liberty & Donald Xie
- Beginning C# Jack Purdum
- MSDN library from Microsoft