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NEXTREMER SOLUTIONS CASE STUDY

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CASE STUDY

1.1 ABOUT THE CUSTOMER

The client is involved in a broad range of services like Development, manufacturing, sales, marketing and servicing of information-related equipment (computers and peripherals, including PCs, printers, scanners and projectors), electronic devices (semiconductors, displays, and quartz devices), precision products (watches, plastic corrective lenses, and factory automation equipment) and other products.

1.2 BUSINESS PROBLEM

The client was facing performance and scalability issues with its current Manufacturing Execution System (MES). The legacy application, running on Solaris faced time constraints, thereby impacting the processing of additional products thus constraining their business growth.

The key challenges were:

- The application involved numerous mathematical functions. So, the opportunities for performance improvement using traditional approaches, like tuning etc. were limited.
- Cost reduction for the traditional licensed software's.
- Multithreading to improve performance and scalability was not a viable option since the traditional software's did not support multiple concurrent threads.
- Complex operations and lack of appropriate documentation

Additional functionalities to support the existing MES.

1.3 BUSINESS OPPORTUNITES

With a pro-active and holistic performance engineering approach the twin issues of performance and scalability could be resolved. Some of the other opportunities are:

- Analyzing the application with the objective of introducing parallelization to address performance issues.

Migration from traditional to open source software's.

1.4 PROJECT SUMMARY

Project scope is delivered in several releases. This is especially important considering the new technology stack which is used for the first time with this project.

Starting with the waterfall development process methodology, whenever it is possible to move the development model towards Agile.

Processes are defined for Fast-tracking activities, mid-term releases, working with outsourced labor and high-level control by PDM & PJM teams.

Project background	
Size of Project	750 man months
Peak team size	Total: 55
Duration	2.5 years
Location	Offshore-Onsite

The primary focus of MES is Process Control and Management.

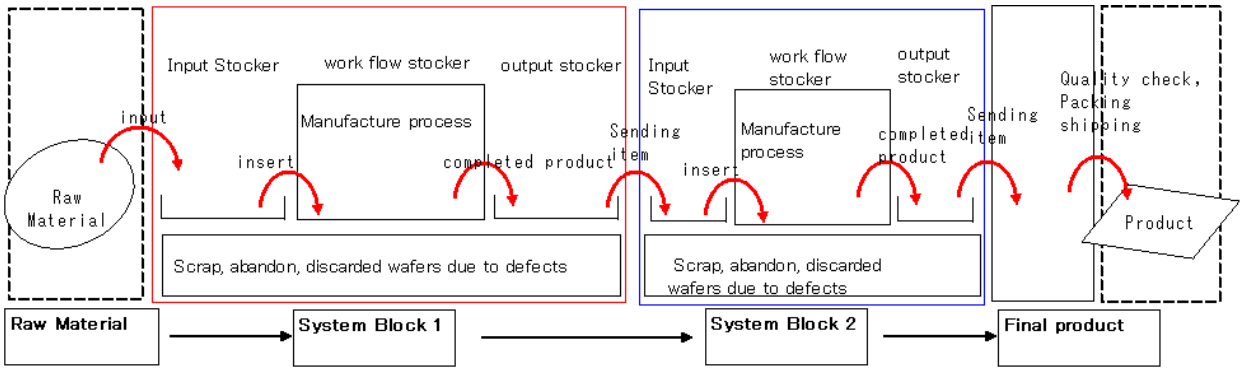
Scheduling, executing and monitoring the production activity, quality checks etc. are the primary tasks.

Some of the other functions involved are:

- Work Scheduling would schedule the product, quantity etc. on a daily basis
- production resource allotment would identify the resources for carrying out the production activity
- Data accumulation would be carried out at every stage for quality checks, report generation etc,
- Worker management is used to manage staff, managers and operators
- Quality checks performed and monitored..
- Maintenance activities for machines, stockers and transport vehicles are also included in the MES.
- Achievement Analysis is done for improving efficiency, quality and productivity.

Finished product are packed, checked for quality etc. before being shipped out

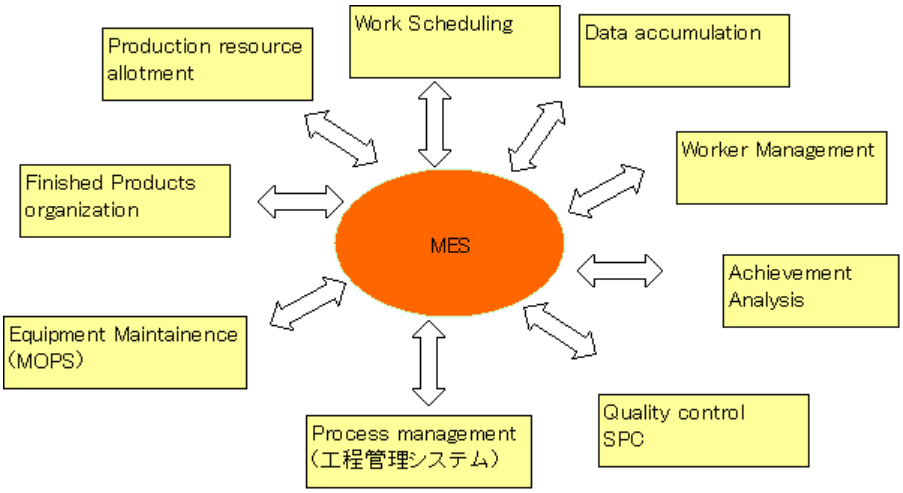
1.5 APPLICATION ARCHITECTURE



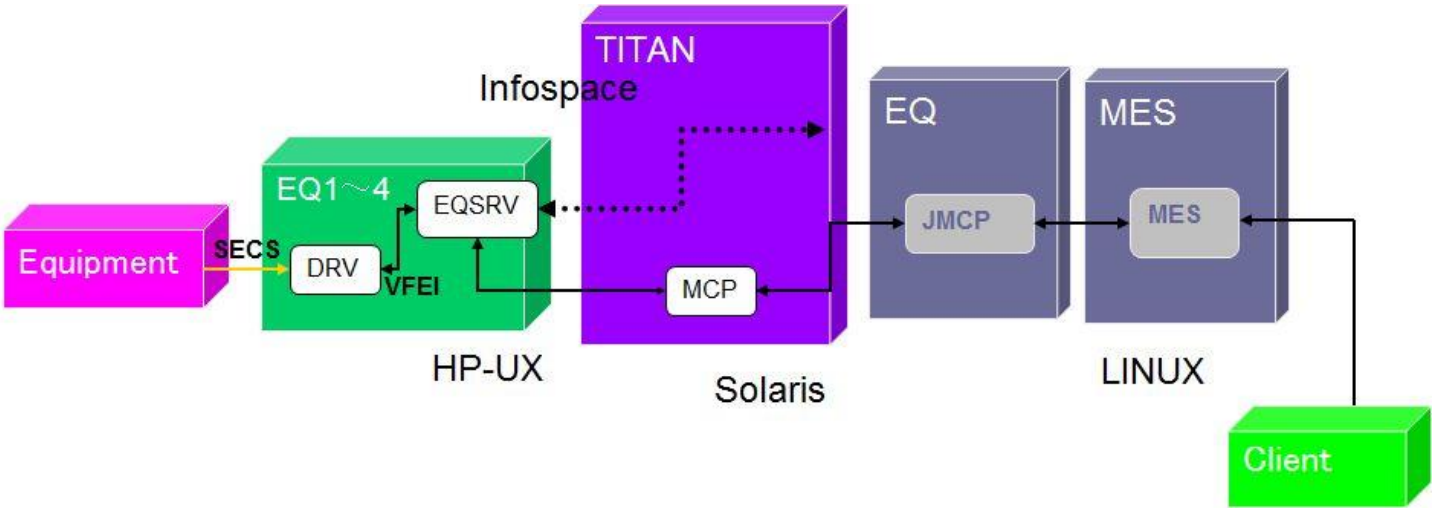
Highlights:

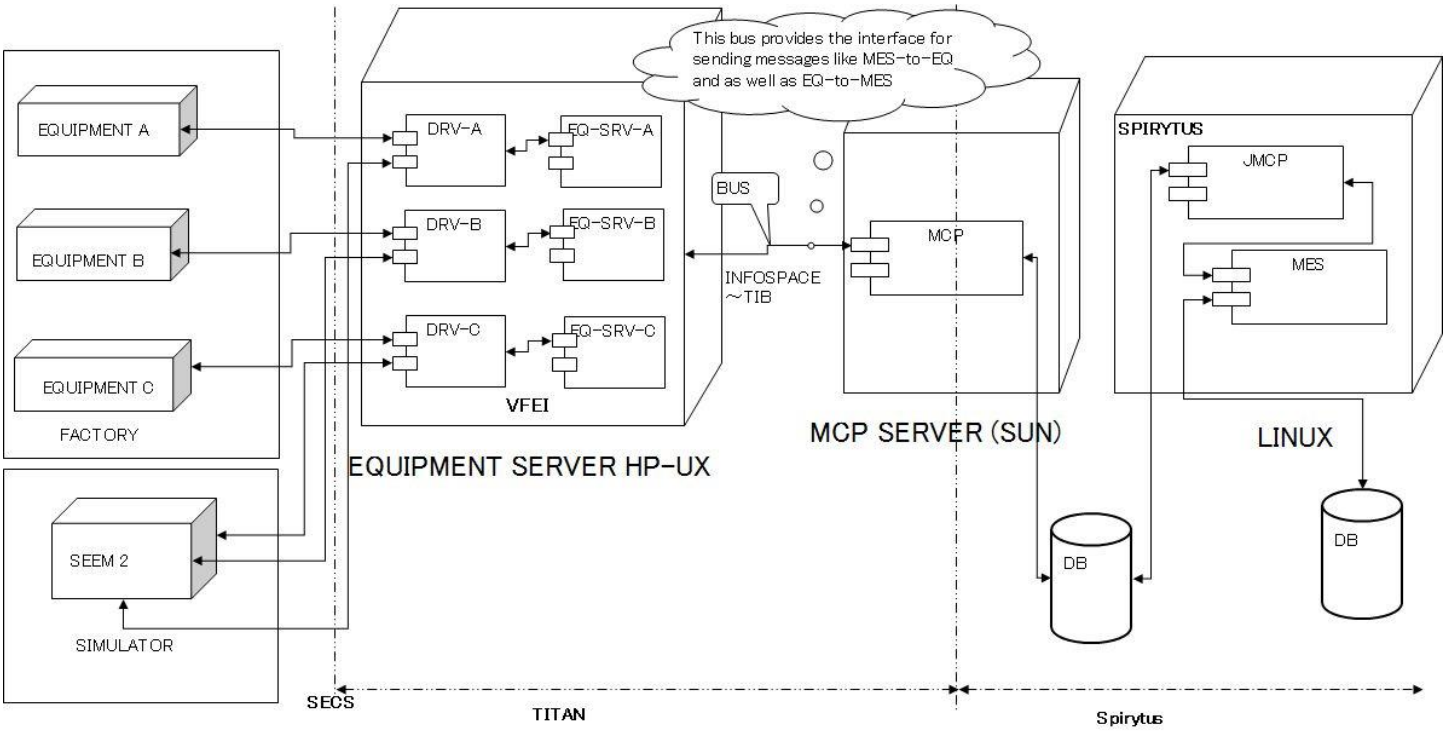
- Upward Scalability
- Interfaces for process monitoring.
- Rigorous Quality checks inculcated.
- Modules to search and display the status of production at any given time.
- High performance rendering software and improved flexibility through multi-layered architecture.

The judicious usage of applying the offshore Delivery Model helped the client to stay profitable by cutting development and operational expenditure.



1.5.1 SYSTEM ARCHITECTURE


TITAN
Infospace
EQ
MES
EQ1~4
EQSRV
JMCP
MES
Equipment
SECS
DRV
VFEI
MCP
HP-UX
Solaris
LINUX
Client


This bus provides the interface for sending messages like MES-to-EQ and as well as EQ-to-MES
EQUIPMENT A
EQUIPMENT B
EQUIPMENT C
FACTORY
DRV-A
EQ-SRV-A
DRV-B
EQ-SRV-B
DRV-C
EQ-SRV-C
VFEI
BUS
INFOSPACE ~TIB
MCP
MCP SERVER (SUN)
SPIRYTUS
JMCP
MES
LINUX
DB
DB
SEEM 2
SIMULATOR
EQUIPMENT SERVER HP-UX
SECS
TITAN
Spirytus

System Architecture in details:

1.Communication between Equipment and the Eq. server is aided by the use of drivers.
Equipment servers handles all the operations, communications related to equipment through these drivers(DRV)
The Eq. Server also interacts with the MCP Server through INFOSPACE ～TIB (a communication framework).
MCP server and the JMCP server are the message converting agents between the MES server and the Eq. Server.

2.A Simulator acts similar to an equipment. It is used for Testing purpose (in the development phase of the Project).
The messages sent by the Simulator are similar to those which would be sent by the actual Equipment.

- **Technology overview**

Technologies utilized	
Technologies	Server: C/C++, Java, Mysql, Jboss, J2EE, Cask (Internal Framework), Jfreechart, itext, poi, hibernate. Client: VB
Tools	Eclipse, Message Formatter, MSDN.

1.6 CLIENT BENEFITS

Significant benefits apart from cost reductions where derived some of them are:

- Improved performance allowing parallel processing of complex functionalities, the improvement reduced the response time to less than 5 seconds.
- Standards-based technologies to enable easier connectivity and integration, and the creation of service-oriented architectures based on open standards such as XML, SOAP, etc.
- Migration costs would be reduced as the solution is upward compatible.

- Documentation and knowledge management has been facilitated to address the problem of training new staff and operators.