



# Ford Builds Better Cars with IMS and other z Software

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IBM Software

Information On Demand **2011**



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# This presentation will cover the following

- Business Overview of Ford & its Material Planning and Logistics Business  
[Video Intro](http://www.youtube.com/watch?v=7e94NCvq998) <http://www.youtube.com/watch?v=7e94NCvq998>
  
- Ford Information Technology and Architecture
  
- Applications Overview for Modernizing Mainframe Applications
  - Materials Management
  - Procurement Requisitioning
  
- Conclusion

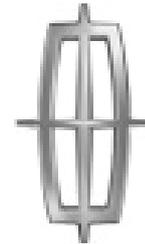


# Business Overview – Ford Motor Company

➤ *Automotive Brands*



[www.ford.com](http://www.ford.com)



L I N C O L N

[www.lincoln.com](http://www.lincoln.com)

➤ *Financial Services*



**FordCredit**

[www.fordcredit.com](http://www.fordcredit.com)





# Business Overview – Ford Motor Company

## ➔ Customer Services



# Business Overview – Ford Motor Company

## ▶ *Global Groups*

▶ *Product Development*

▶ *Manufacturing*

▶ *Marketing*

▶ *Purchasing*

▶ *Quality*

▶ *Human Resources*

▶ *Office of the General Counsel*

▶ *Finance*

▶ *Sustainability, Environment & Safety Engineering*

▶ *Information Technology*

▶ *Government and Community Relations*

## ▶ *Geography*

▶ *The Americas*

▶ *Europe*

▶ *Asia Pacific and Africa*

# Ford Motor Company - Facts and Figures

- ▶ Worldwide automotive company
  - ▶ William Clay Ford, Jr.  
Executive Chairman
  - ▶ 2010 revenue, \$128 billion
  - ▶ 2010 net income \$6.6 billion

- ▶ founded in 1903
- ▶ Alan Mulally  
President and CEO
- ▶ 164,000 global employees
- ▶ 70 plants

## Ford

▶ 10,719 dealers



### Sales (by automotive segment)

Ford North America  
 Ford South America  
 Ford Europe  
 Ford Asia Pacific Africa

Volvo  
 TOTAL

## Lincoln

▶ 284 dealers



L I N C O L N

(in thousands)

2,413  
 489  
 1,573  
 838  
211  
 5,524

### Sources:

Ford Motor Company 2010 Annual Report  
 Ford Sustainability Report 2010 /11



# Information Technology

## Nick Smither

**Group Vice President & Chief Information Officer**

**7,000+ Ford & Agency IT employees worldwide**

## Application Development (AD) and Mainframe Strategy



# Ford IT Application Development - The Plan

create.value  
deliverSolutions innovateFord

## ONE AD

create.value  
deliverSolutions innovateFord

**One Team • One Goal • One Plan**

### ONE TEAM

- People working together in a culture of technical excellence, knowledge management, collaboration and high energy!

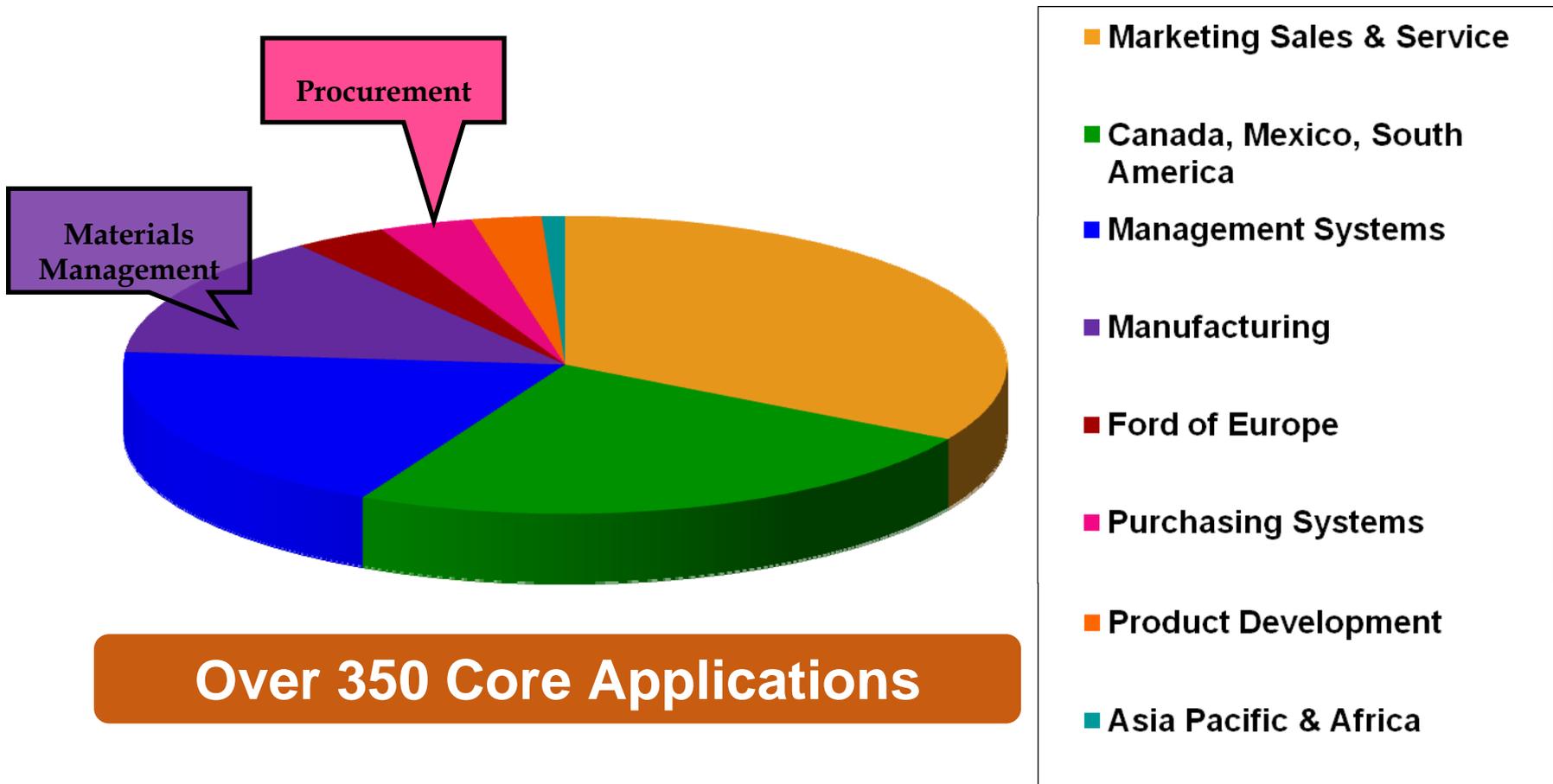
### ONE PLAN

- *Agile:* Drive faster time to market and more rapid realization of business value
- *Global:* Build a global delivery team that delivers solutions on-time, on-budget with quality
- *Innovative:* Enable business innovation through rapid ideation and prototyping, new technology introductions, and leading-edge solutions
- *Lean:* Target energy to the creation of value for our customers and focus on the elimination of waste
- *Empowered:* A culture that rewards people to deliver, create and innovate together

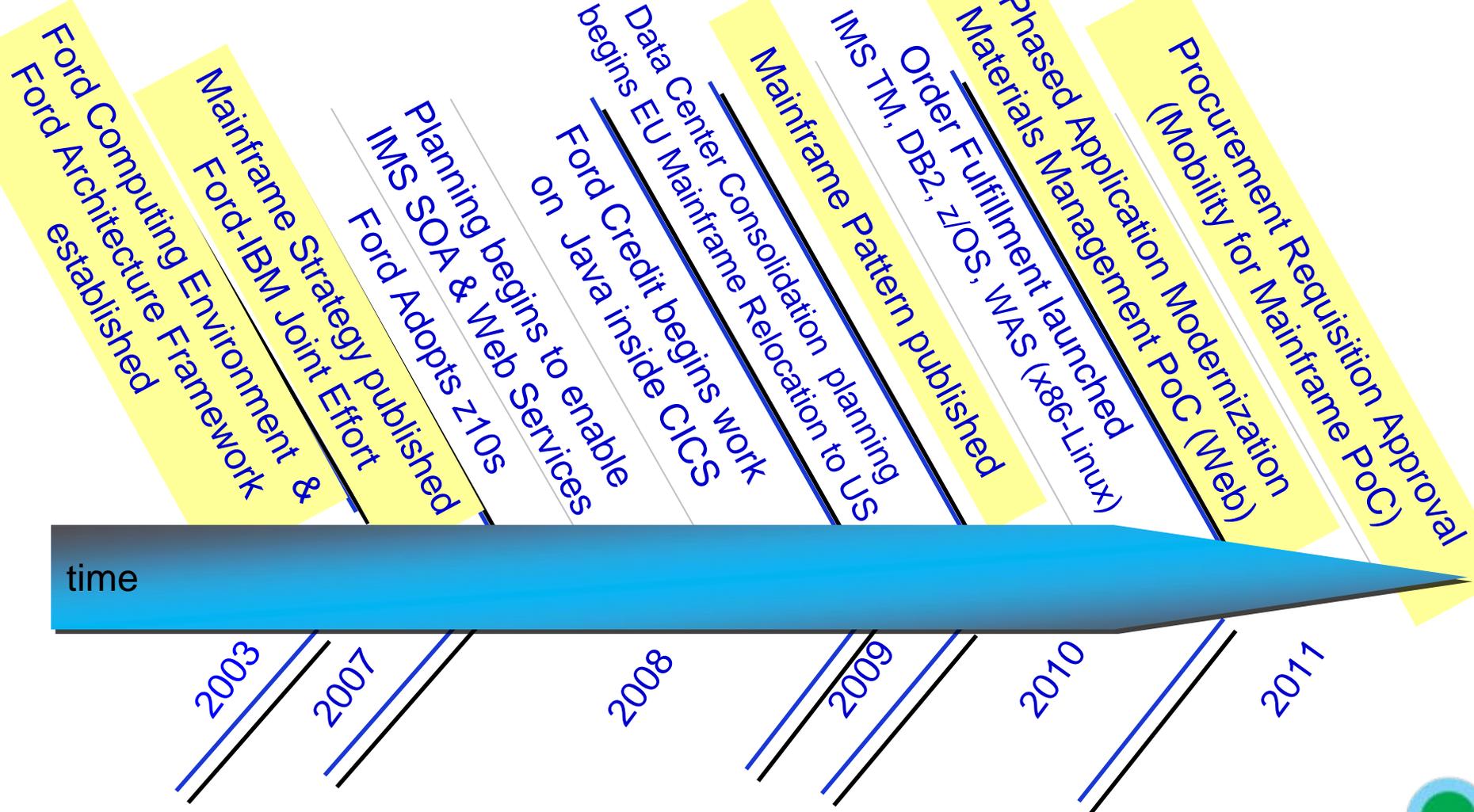
### ONE GOAL

- Our customers see us as a progressive IT organization and strategic partner focused together to create value, deliver solutions, and innovate Ford!

# Line of Business Applications that Use the Mainframe



# Architecture Timeline for Mainframe at Ford



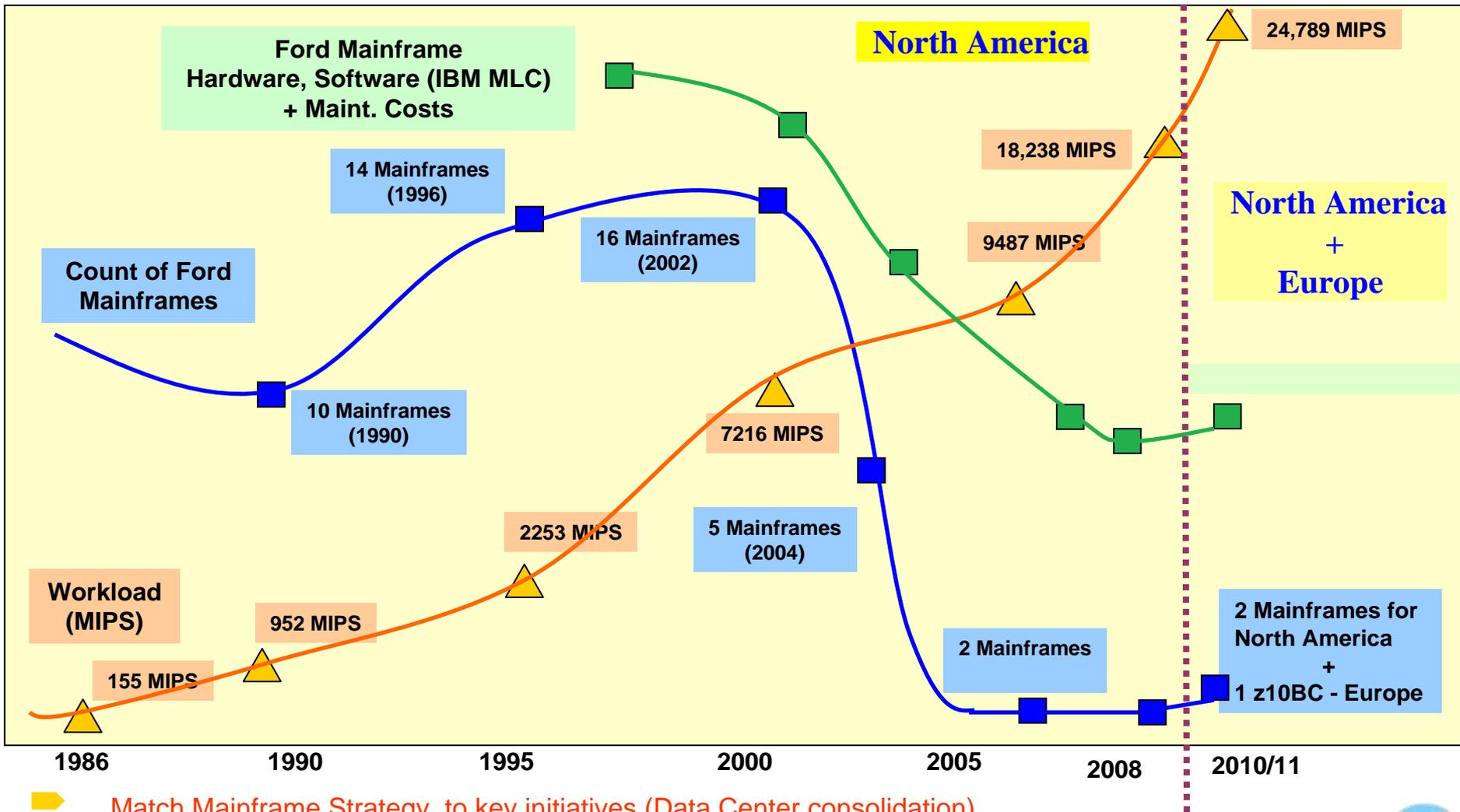
time



# Mainframe Historical Cost Reduction at Ford North America



Global Data Center Consolidation



Match Mainframe Strategy to key initiatives (Data Center consolidation)

Sources: AI Cauchi, IBM System Z Technical Specialist  
 Bruce Miller, Ford, Large Systems Manager,

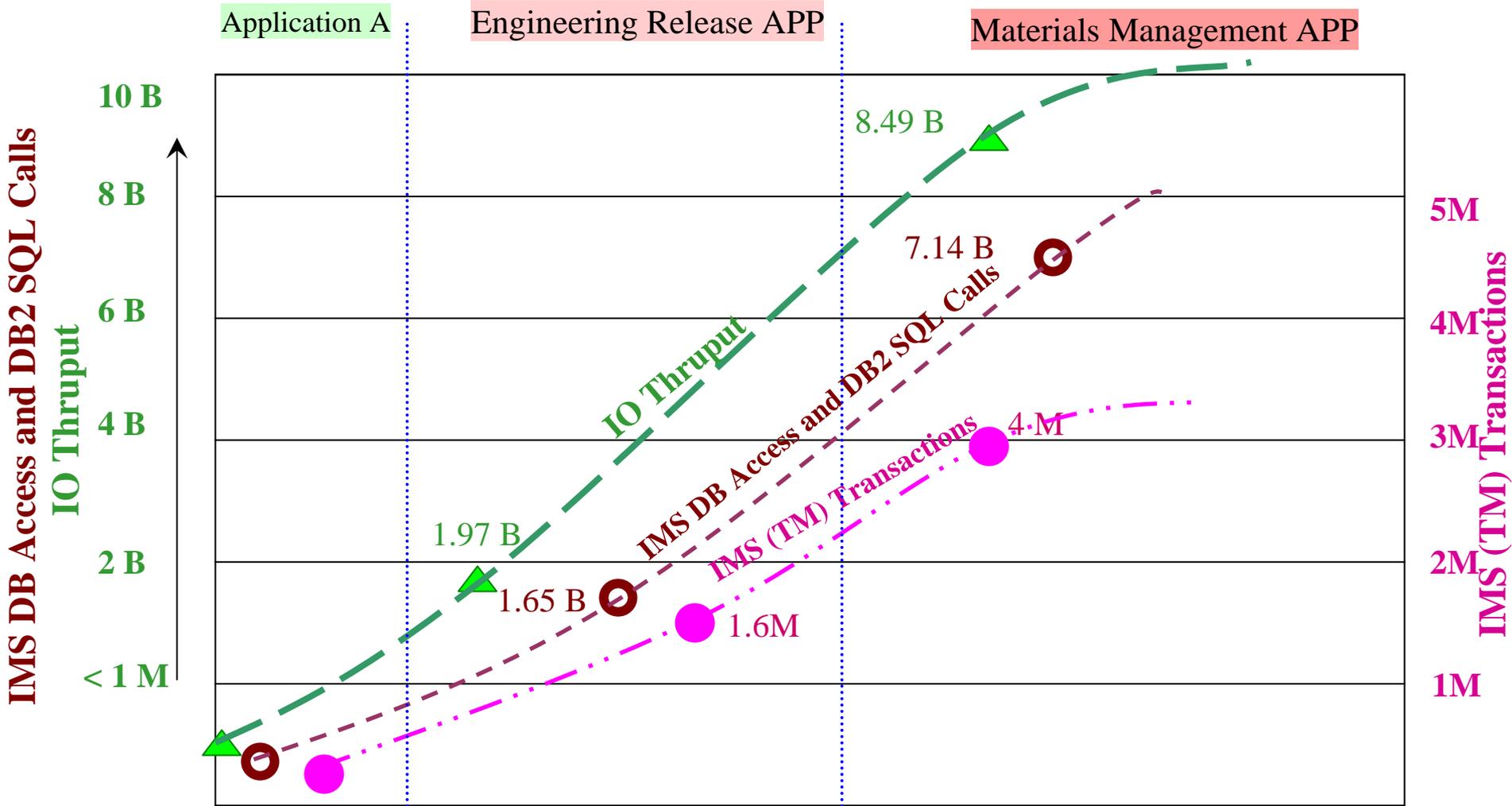
Author: Keshav Rakshit, IBM z Client Architect



Information On Demand 2011



# Transaction Volume of Current Materials Management App ( 24 hour Average )

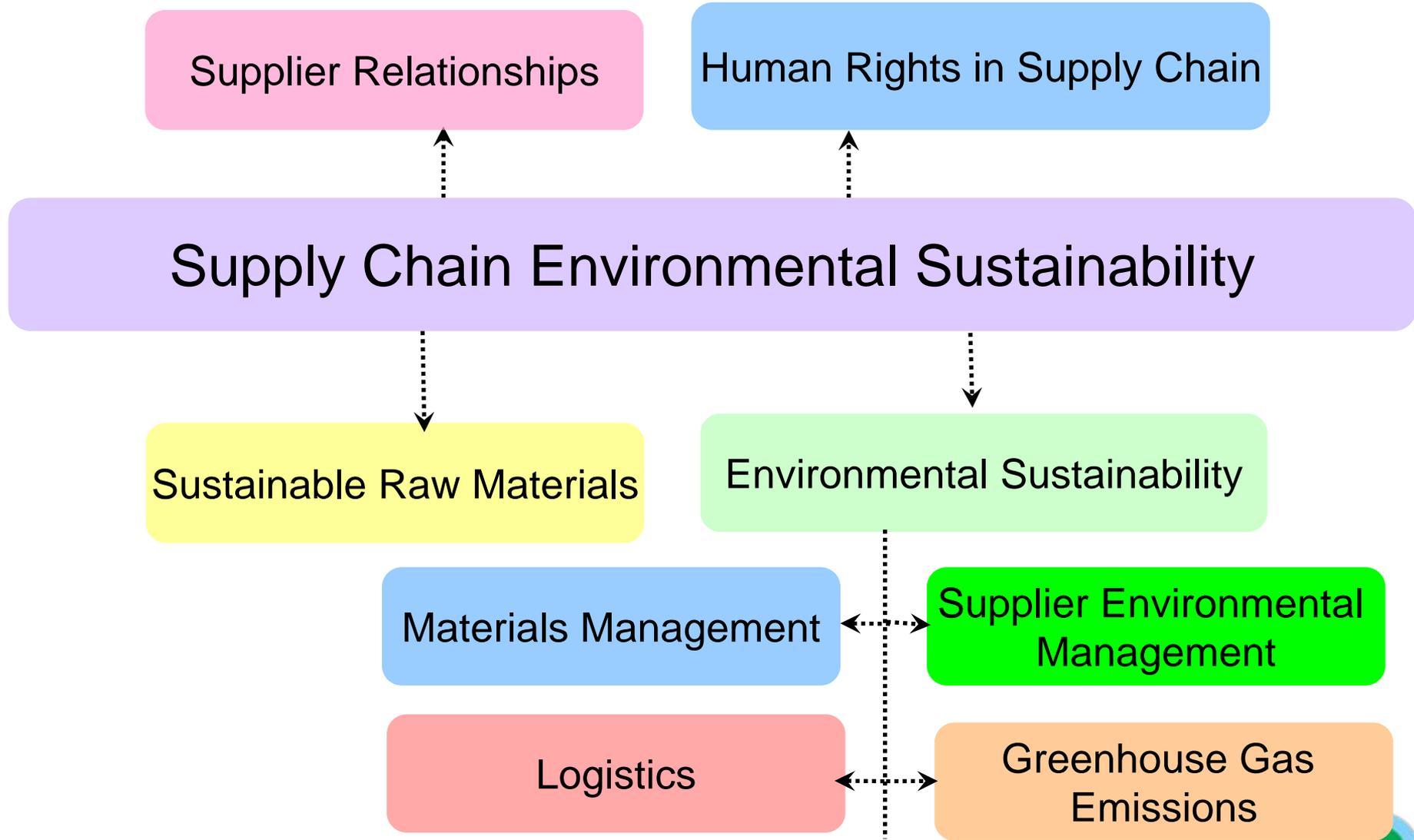


Disclaimer: Actual Peak Usage may be higher than the numbers represented above

- IMS DB Access and DB2 SQL Calls
- IMS (TM) Transactions
- IO Thruput



# Ford Material Planning and Logistics Business



# Materials Management within overall business



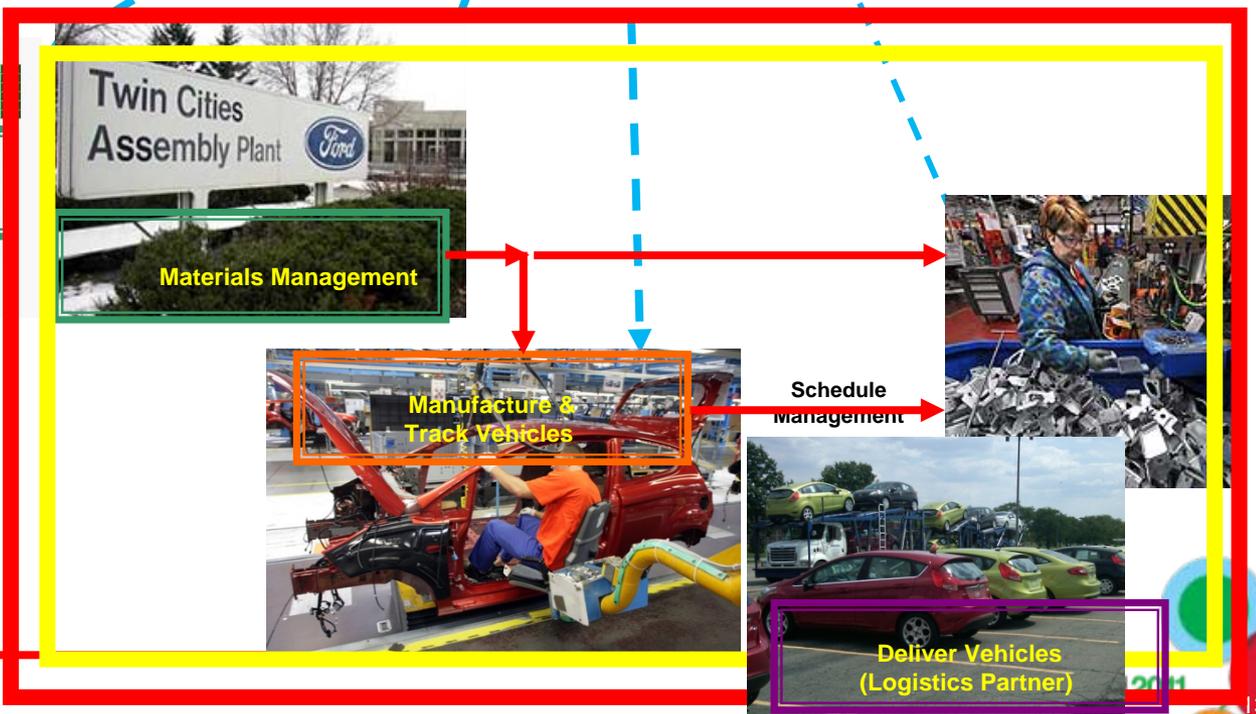
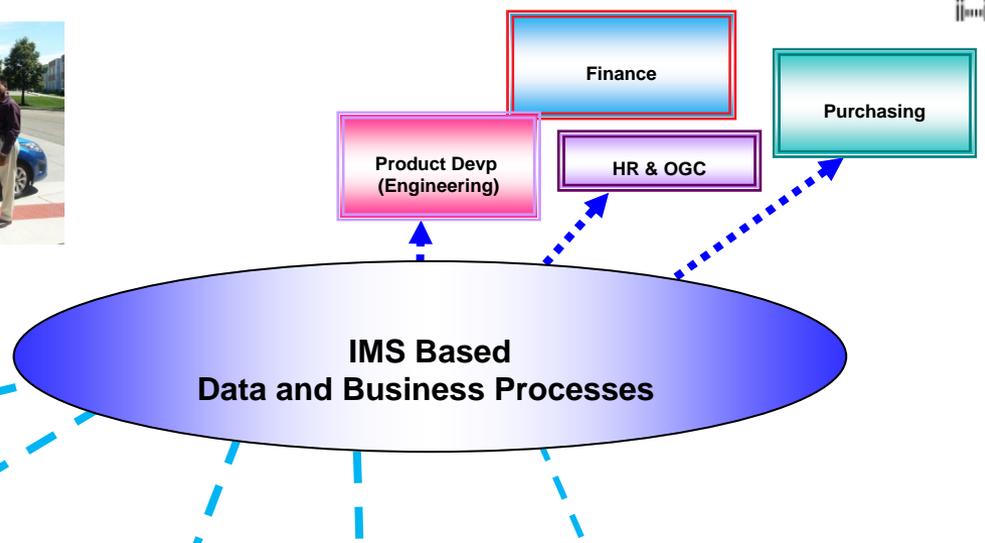
IMS MFS Web Environment

CMGTARA INVENTORY TRANSACTION HISTORY GENERAL 05/13/11 13:11:10

START DATE: 02/03/08

**Materials Management**

SHIP	Repl	Process	Qty	Unit	From	Reference	Convay	Misc	C
Date	Date	Date	Quantity		Number	Number	Info	1	UM
020909	020909		1		0000206166	2058021	AF31A	EA	
021610	020909		1		0000006508	30		EA	
022710	021910		1		0000000072	1234567		EA	
021910	021910		1		0000000072	1234567		EA	
021910	021910		1		00000000212	1234567		EA	
021910	021910		1		00000000212	1234567		EA	
021910	021910		1		00000000212	1234567		EA	
021910	021910		1		00000000215	1234567		EA	
021910	021910		1		00000000220	1234567		EA	



# Materials Management: Application Modernization

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Receiving

Shipping

Inventory

Warehousing

Supplier Release

Engineering  
Bill of Material  
to  
Manufacturing  
Bill of Material

## BUSINESS CHARACTERISTICS Over 30 Major business functions

### Services

- Ford Manufacturing
- Materials Management
- Supply Chain, 1.7 Million Parts

# Materials Management: Application Modernization



## APPLICATION CHARACTERISTICS

- 24x7 application
- 27000 Users
- 1250 Screens, 1400 Reports, 1400 heavy batch processes

### Yearly

- Average Throughput 2.5 Trillion I/O
- Five Billion (heavy-duty) stored procedures
- Two Trillion (intense) SQL statements

Numbers are average/typical for a year. Peak consumption rates may be higher.



# Nonfunctional characteristics of Materials Management transactions

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1. Hierarchical Data Structure
2. Stateful Application Processes
3. IO Intensive Transactions: Complex and Data Intensive Transaction
4. Conversational Transaction Flows (with FULL Database Locking)
5. Long Running Processes, Restart-able Transactions, Recoverable Transactions
6. Once and Only Once Guaranteed Delivery of Transactions
7. Extensive Use of Stored Procedures

Within a Transaction there are numerous Iterations between Users and Backend CMMS System and other system and numerous iterations between backend CMMS System and other application.

**Online Response Times 50-54 Milliseconds**

**Availability SLA Greater than 99.99%**

**Data is replicated Synchronously across both Data Centers Active Active Configuration**

**Security: Evaluation Assurance Level 5 (EAL 5)**

**Memory Security: Storage Protect Keys for Application and Data Security**

**Triple DES (Data Encryption) , SHA-512 (Secure Hash Signature Standard)**

**Ability to address 92 different types of Security APIs**



# NextGen Materials Management

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## KEY PRIORITIES

- Allow Future Development on Mainframe with new Technology while modernizing the Legacy interfaces with single UI.
  - Uplift Legacy for Modern Technology.
  - Eliminate inhibitors such as 3270 Emulator
  - Avoid rewrite and reconstruction of Business Logic

## MODERNIZATION APPROACH

- Work with IBM for software product(s) that can support our priorities.
- The product should support new development and modernize our legacy and co-exist as a single application to the Business Users
- Use Phased, Iterative approach to support development and transition.

# Technical PoC - NextGen Materials Management

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## Scope

- Reuse Business Process Logic
- Transform Green Screen to Web ...with no compromise to current functionality and

## Vision

**Uplifting legacy system to integrate with new development....**

## Next Steps

- **Many steps in the journey...continue to work through the issues etc**

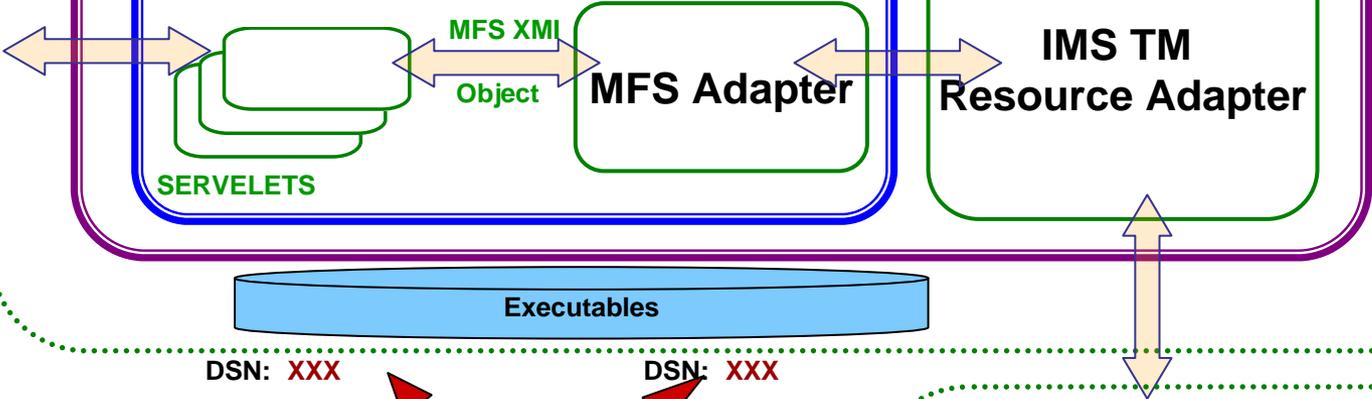
# MFS Web Enablement for Materials Management PoC



## Facility T: ITO Test Main Frame LPAR

### Websphere Process Server WPS (v7.0)

### MFS Web Enablement Application(v9.3.0)



## Developer Work Station

### Websphere Process Server WPS (DOS) (v7.0) - (MFS XML Utility)

Utility includes FTP layer to receive Source and send objects

- 3- FTP (push) MFS WEA executables to Test MF.
- 2- Create MFS WEA runtime executables using MFS XML Utility.
- 1- FTP PoC1 Screen MFS source to desk top.

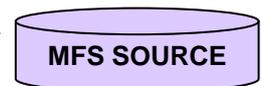
## Facility B: SYB7 / TSO4

### IMS Connect

### CMMS Test (IMST1 v10)

### IMS DB/DC

### DB2 - DSN7



Need WPS and MFS XML Utility KT for Geeta?

Developer **Creates** MFS WE runtime objects

DSN: MFMPLS,PROD,MFS and 2011



# Materials Management Application Menu: Before Modernization

```

Session A - [24 x 80]
File Edit View Communication Actions Window Help
[Icons]

SDMEN1                                IMST7 Application Menu                                05/06/11 10:36:36
==>  _

SEL DESCRIPTION                        SEL DESCRIPTION
-- -----
01 CMMS3/Common Material Mgmt System
03 SOLMIS/SOLMIS Mailbox
16 COPAC
19 Centralized Vehicle Systems
20 MileMaker
21 MSIII/Material Supply Systems
22 B&A/EASI Common Support Table
23 MSIII/DataBase Look-up
24 A.E.A.S.I./Eff Point Ctl/Float
43 B&A Printer Assignment
44 Mexican Customs Systems
98 /FOR DISPLAY
99 /FOR COMMAND

F1=Help      F3=Exit IMS

a
02/006

```



# Materials Management Application Menu: After Modernization

http://localhost:9080/scn2/poc1s2 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://localhost:9080/scn2/poc1s2 Go Links

IBM. IMS MFS Web Enablement

Submit Clear Fields Next Page Reset Logout Help

SDMEN1 IMST7 Application Menu 05/06/11 10:35:20

SEL	DESCRIPTION	SEL	DESCRIPTION
01	CMS3/Common Material Mgmt System		
03	SOLMIS/SOLMIS Mailbox		
16	COPAC		
19	Centralized Vehicle Systems		
20	MileMaker		
21	MSIII/Material Supply Systems		
22	B&A/EASI Common Support Table		
23	MSIII/DataBase Look-up		
24	A.E.A.S.I./Eff Point Ctl/Float		
43	B&A Printer Assignment		
44	Mexican Customs Systems		
98	/FOR DISPLAY		
99	/FOR COMMAND		

PF1  
PF2  
PF3  
PF4  
PF5  
PF6  
PF7  
PF8  
PF9  
PF10  
PF11  
PF12

F1=Help F3=Exit IMS

Done Local intranet





# Materials Management

## Inventory Transaction History: Before Modernization

```

CMMSTABA          INVENTORY TRANSACTION HISTORY GENERAL          10/15/11 21:30:17
==> _____ PLT MS09B MS9B

PART NUMBER:      -      CTN-_____  START DATE: 09/15/2010
SUPPLIER: D101A   CUSTOMER: _____  TRANS CODE: ____

A Trn SHIP   Rcpt   Process   Cum From   Reference   Convey   Misc   C
C Cd  Date   Date   Date   Quantity  01/01/09   Number   Number  Info  I  UM
-----
64  091510   091510   091510    1          00000000228 1234567
64  092210   092210   092210    2          00000000229 1234567
64  092210   092210   092210    1          00000000230 1234567
64  092910   092910   092910    1          00000000232 1234567
64  092910   092910   092910    1          00000000233 1234567
64  110310   110310   110310    1          00000000243 1
64  110310   110310   110310    1          00000000244 1
64  110310   110310   110310    1          00000000245 1234567
64  110310   110310   110310    1          00000000246 1234567
64  110510   110510   110510    1          00000000247 1234567
64  110510   110510   110510    1          00000000248 1234567

F1=Help  F2=Reconciliation Update  F4=Other Trans  F6=Next Supplier/Customer
F10=Transaction Detail           F11=Transaction Correction
MORE RECORDS AVAILABLE

MA a
02/006

```



# Materials Management: After Modernization

IBM IMS MFS Web Enablement

Submit Clear Fields Next Page Reset Logout Help

CMMSTABA INVENTORY TRANSACTION HISTORY GENERAL 05/13/11 13:11:10  
 --> PLT MS09B MS9B

PART NUMBER: CTN-  
 SUPPLIER: D101A CUSTOMER:

A	Trn	SHIP	Rcpt	Process	Quantity
C	Cd	Date	Date	Date	
	63P	020909	020909	020909	1
	64	082009		082009	1
	64	021610		021610	1
	64	052710		052710	1
	64	081910		081910	1
	64	081910		081910	1-
	64	081910		081910	1
	64	081910		081910	1
	64	081910		081910	1
	64	082510		082510	1
	64	083010		083010	1

IBM IMS MFS Web Enablement

Submit Clear Fields Next Page Reset Logout Help

CMMSTABA INVENTORY TRANSACTION HISTORY GENERAL 06/09/11 12:56:51  
 --> PLT MS09B MS9B

PART NUMBER: CTN- START DATE: 01/01/2007  
 SUPPLIER:  CUSTOMER:  TRANS CODE:

A	Trn	TRANS	Rcpt	Process	Cum From	Reference	Convey	Misc	C	
C	Cd	Date	Date	Date	Quantity	01/01/09	Number	Info	I	UM
	x	36	120108	030509	123989					EA
		36	010109	050609	123987					EA
		36	010109	050709	123987					EA
		36	010109	050909	123987					EA

F1=Help F2=Reconciliation Update F10=Transaction Detail F11=Transaction Correction  
 MORE RECORDS AVAILABLE

F1=Help F2=Reconciliation Update F4=Other Trans F6=Next Supplier/Customer  
 F10=Transaction Detail F11=Transaction Correction  
 NO MORE RECORDS AVAILABLE 3001





# Materials Management

## Inventory Transaction History: Before Modernization

```

CMMSTABA          INVENTORY TRANSACTION HISTORY GENERAL          10/15/11 21:30:17
==> _____ PLT MS09B MS9B

PART NUMBER:      -      CTN-_____  START DATE: 09/15/2010
SUPPLIER: D101A   CUSTOMER: _____  TRANS CODE: ____

A Trn SHIP   Rcpt   Process   Cum From   Reference   Convey   Misc   C
C Cd  Date   Date   Date   Quantity   01/01/09   Number   Number   Info   I   UM
-----
64  091510   091510   091510   1           00000000228 1234567
64  092210   092210   092210   2           00000000229 1234567
64  092210   092210   092210   1           00000000230 1234567
64  092910   092910   092910   1           00000000232 1234567
64  092910   092910   092910   1           00000000233 1234567
64  110310   110310   110310   1           00000000243 1
64  110310   110310   110310   1           00000000244 1
64  110310   110310   110310   1           00000000245 1234567
64  110310   110310   110310   1           00000000246 1234567
64  110510   110510   110510   1           00000000247 1234567
64  110510   110510   110510   1           00000000248 1234567

F1=Help  F2=Reconciliation Update  F4=Other Trans  F6=Next Supplier/Customer
F10=Transaction Detail           F11=Transaction Correction
MORE RECORDS AVAILABLE

MA a
02/006

```



# Materials Management: After Modernization

## More than 11 records per screen



http://localhost:9080/geetart1/geetart1 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Print Mail Stop

Address http://localhost:9080/geetart1/geetart1 Go Links

IBM IMS MFS Web Enablement

Submit Clear Fields Next Page Reset Logout Help

CMMSTABT INVENTORY TRANSACTION HISTORY GENERAL 05/20/11 15:30:08  
 ==> PLT MS09B MS9B

PART NUMBER: - CTN- START DATE: 01/01/2007  
 SUPPLIER: D101A CUSTOMER: TRANS CODE:

A	Trn	SHIP	Rcpt	Process	Cum	From	Reference	Convey	Misc	C
C	Cd	Date	Date	Date	Quantity	01/01/09	Number	Number	Info	I UM
63P	020909	020909	020909	1			00000206166	2050821	AF31A	EA
64	082009		082009	1			00000206528	32		EA
64	021610		021610	1			00000000150	C123456		EA
64	052710		052710	1			00000000203	AAAAAAA		EA
64	081910		081910	1			00000000212	1234567	X	EA
64	081910		081910	1-			00000000212	1234567	R	EA
64	081910		081910	1			00000000212	1234567	XC	EA
64	081910		081910	1-			00000000212	1234567	R	EA
64	081910		081910	1			00000000212	1234567	C	EA
64	082510		082510	1			00000000215	1234567		EA
64	083010		083010	1			00000000220	1234567	X	EA
64	083010		083010	1			00000000221	1234567		EA
64	083010		092110	1-			00000000220	1234567	R	EA
64	083010		092110	1			00000000220	1234567	C	EA
64	090210		090210	1			00000000224	1234567		EA
64	090210		090210	1			00000000225	1234567		EA
64	090310		090310	1			00000000226	1234567		EA
64	090310		090310	1			00000000227	1234567		EA
64	091510		091510	1			00000000228	1234567		EA
64	092210		092210	2			00000000229	1234567		EA

F1=Help F2=Reconciliation Update F4=Other Trans F6=Next Supplier/Customer  
 F10=Transaction Detail F11=Transaction Correction

64 092210 092210 1 00000000230 123 6701

PF1 PF19  
 PF2 PF20  
 PF3 PF21  
 PF4 PF22  
 PF5 PF23  
 PF6 PF24  
 PF7  
 PF8  
 PF9  
 PF10  
 PF11  
 PF12  
 PF13  
 PF14  
 PF15  
 PF16  
 PF17  
 PF18

Done Demand 2011



# NextGen CMMS - POC Team



(photos of all)

Ford - AL

Ford - ITC

IBM T

IBM

Keshav Rakshit  
Nancy Stein  
Kevin Lo  
George Hebert  
Shyh-Mei Ho



Shyh-Mei Ho



This is George Hebert's pic  
Requested new



Kevin Lo

Emphasize on  
1) Combination of skills required  
2) Collaboration of teams  
3) Organization priorities???



# Procurement: Application Modernization PoC

**SCOPE:** Requisition Approval

**USERS:** Enterprise-wide

**SUCCESS FACTORS:** Demonstrate key use-cases enabling mobile access to legacy mainframe applications

## BlackBerry

CPARS Mobile

**Review and take action**

**Division/Plant:** A01

**Document No:** RQ11105R08

**Request Type:** Expense

**Doc Type:** PN

**Supplier:** D6HRC-EWIE CO INC

## iPhone

CPARS Mobile

 CPARS Mobile

**Review and take action**

**Division/Plant:** A01

**Document No:** RQ11102R01

**Request Type:** Expense

**Doc Type:** PN

**Supplier:** D6HRC-EWIE CO INC

**Cost:** \$1,221.00USD

**Purpose:** TEST MOBILE1

Reject...

Approve

## Android

 CPARS Mobile 

 CPARS Mobile

**Review and take action**

**Division/Plant:** A01

**Document No:** RQ11105R09

**Request Type:** Expense

**Doc Type:** PN

**Supplier:** D6HRC-EWIE CO INC

**Cost:** \$1,375.00USD

**Purpose:** TEST REQ'S FOR DEVICE6

Reject...

Approve

**DEMO**



# Recap

- Business Overview of Ford Motor Company
- Ford Information Technology and Architecture
- Applications Overview Approaches
  - Procurement Application Modernization
  - Materials Management Modernization
- Conclusion



# Conclusion

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- ▶ The Mainframe continues as part of the Enterprise Strategic Plan.
- ▶ During the 90's and early 2000's there were perceptions in the IT Industry that Mainframes would be replaced.
- ▶ Core assets (Data and Business Processes) continue to exist on the Mainframe.
  
- ▶ Mainframe Application Modernization is important to business for building Cars.
  - ▶ Modernize User Interface and Reuse (Web and Mobile as appropriate)
  - ▶ Expand Functionality & Unify with Legacy
  - ▶ Support Internationalization & Expand to meet Global Demand



**Drive one.**

**[www.ford.com](http://www.ford.com)**

