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Implications of technical data exchange for the metalforming sector – a DTI ICT Carrier Project Report.

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DTI – ICT Carrier Programme

Second Phase £12m (2001 – 2004)

Purpose To transfer existing successful knowledge from one sector into another – NOT a research activity

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In this project the “knowledge” concerns the electronic exchange of technical information throughout the metalforming supply chain –

customer ↔ Tier 1 --- n suppliers in line with automotive industry practice

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Why automotive?

Region	Market Share (%)	Value ($) Billion
USA	50	110
EU	34	73
Japan	6	13
Canada	6	13
Other	4	4
Total	100	213

Size and value of the world aerospace sector 2000

Ford turnover 2001 $ 131 bn

GM turnover 2001 $151 bn

Source AECMA, AIA, AIAC, SJAC

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PHASE	ONE	TWO	THREE	FOUR
Data Communication Methods	Point to Point Direct Connection	Value Added Networks	Internet	
Data Structures	National and Industry Orientated EDI Data Structures e.g.	International EDI Data Structures (gradual convergence on UN/EDIFACT)		
	ANSI X12 USA TRADACOMS UK GENCOD France VDA SEDAS Germany		National and Industry Orientated XML Data Structures (no defined data structure) same problems as with EDI Phases 1, 2 &3. little interoperability	ebXML global standard. (developed by UN/CEFACT and OASIS)

B2B Developments (not chronological)

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OWNERS	Electronic (Data Systems (EDS)	Dassault Systems	Parametric Technology Corporation (PTC)	Autodesk
Software	SDRC IDEAS	Solid Works	Pro Engineer	Inventor
Kernal	IDEAS	Parasolid	Granite 1	ACIS
Software	UGS (unigraphics)	Spatial	CADSS	
Kernal	Parasolid	ACIS	CADDS	
Software	Solid Edge	Catia		
Kernal	Parasolid	CATIA		

Geometric Modelling Software, Developers and Kernals

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1st CAD package sold in 1970

Now 3D, CAM, CIM, CAE

MRPII, ERP, PDM, PLM

CPC, CRM

MCAD is CAE including design and modelling tools – for the virtual simulation and analysis of components/assemblies

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Business Requirements

- **Shared exchange of technical information is necessary between customers & suppliers, joint venture partnerships etc..**

- **Difficulties arise through use of different software packages and data transfer formats**

- **Interoperability**

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Three distinct interoperability problems exist

- different software on one machine

  - solution file formats and installation configurations

- transfer of files between different CAD systems

  - solution neutral file formats

- interprocess collaboration – sharing all program applications

  - problems of confidentiality and control of date

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General Solution

- Using own IT specialists

  - not universal

- Adopt preferred customer systems

  - expensive and inefficient

- Buy in Application Service Provider (ASP) Solution

Question - what to ask?

- how to judge?

- how much will it cost?

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70% to 90% of all CAD interchange problems are due to bad practice

1999 US study estimated interoperability cost $1bn per year primarily through having to repair data files or re enter data to make them usable for downstream applications

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- **Whilst CAD data interchange is important inside and outside a manufacturing facility it is only a tiny portion of the whole**

- **In the automotive industry work is progressing to integrate all aspects of the business process within a single envelope**

- **To be successful, these must operate in a holistic manner across the supply chain**

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Nottingham Activities

- **Determine typical industrial use of electronic data exchange**
- **Link into an existing multi partner value mapping supply chain project**
- **Extract data exchange activities and classify**
- **Use data to build a metalforming information exchange model**
- **Work with SMMT to integrate metalforming supply chain requirements with auto industry developments (achieve a transfer of the technology**

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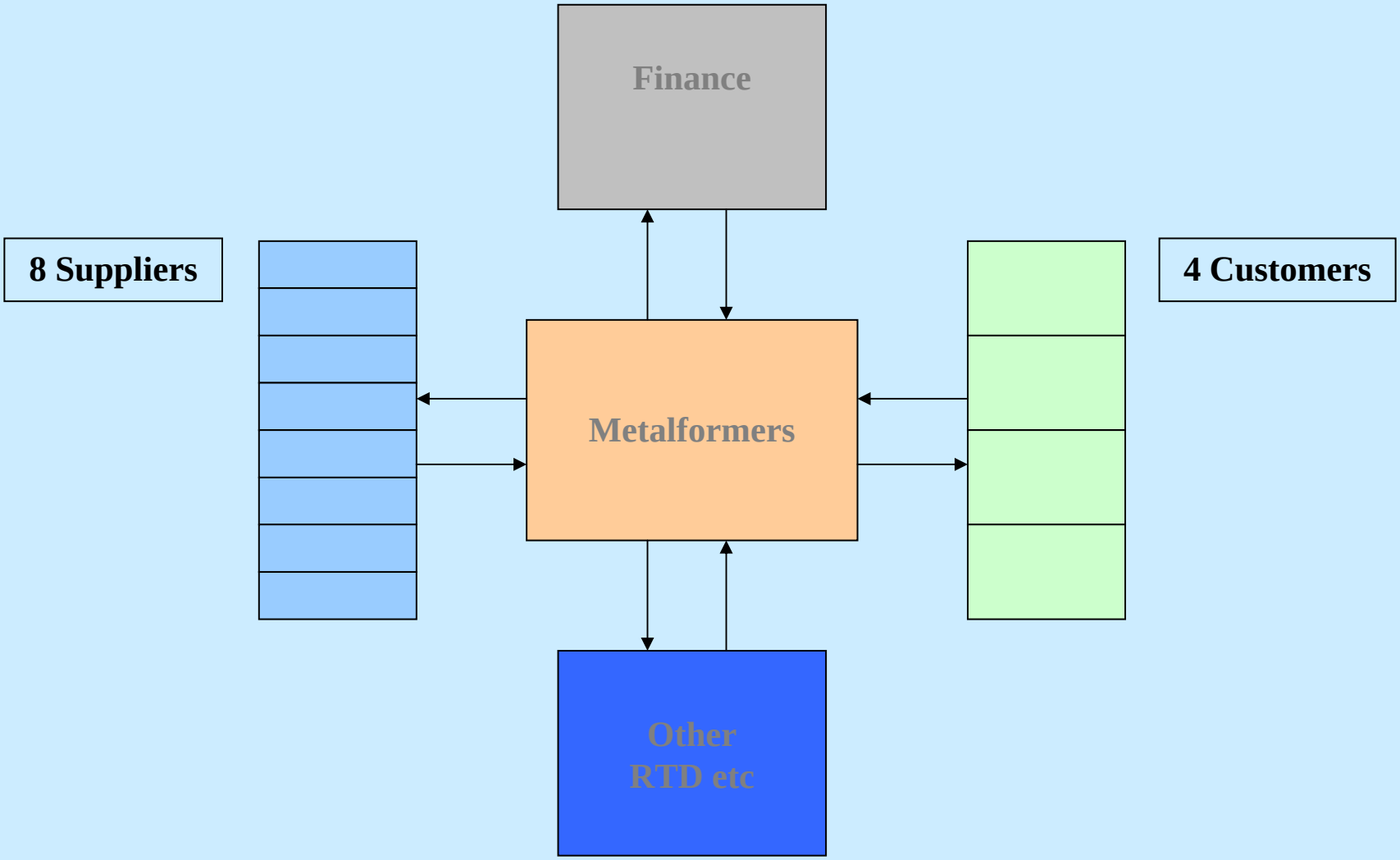
A Supply Chain Model



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Coding References

A (Administrative)

Code	Reference	Details
A1	Communication	IT department and mail service
A2	Health and safety	Accidents, safety measures, health care programs
A3	Human Resources	Pay, OT, personnel problems, recruitment
A4	Security	Security issues and measures

C (Commercial)

Code	Reference	Details
C1	Business Planning	Executive decisions
C2	Finance	Banks, payments, loans
C3	Legal	Lawyers
C4	Legislation	Standards, local, national, regional
C5	Location	Land, factories, Rates
C6	Orders	Material purchasing, quotes and sales/demand
C7	Receiving and Despatch	Deliveries In/Out
C8	Transport	Company vehicles, commercial vehicles

T (Technical)

Code	Reference	Details
T1	Machines	Maintenance, performance
T2	Materials Processing	Process details
T3	Quality Control	Control method and consequences
T4	Research and development	New technologies, experiments
T5	Scheduling	Production numbers and times
T6	Storage	Storage space and quantities
T7	Tooling	Maintenance, performance

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Coding Example

Reference	Code	Options					
Method of exchange	Me	1.Meeting	2.Paper	3.Telephone	4.Fax	5.Electronic (HW/SW)	6.Video Conference
Time	Ti						
Frequency	Fr	1.Hour	2.Day	3.Week	4.Month	5.Annually	6.Spot
Importance	Im	1.As soon as possible	2.As agreed	3.When available			
Name/Type	N/T	1.Entry	2.Quote	3.Confirmation	4.Location	5.Purchases	5.Issue/meet
Supplier/Customer	S1 – Sn/Cu1 – Cux						
Value	Va	1.Positive Contribution	2.Negative Contribution				
Order Number	ON	Order number:					
Quantity	Qu	1.<505pieces	2.>505<1000pieces	3.>1000pieces			
Dispatch	Di	1.2weeks	2.1month	3.6weeks	4.2months	5.Spot	
Specification	Sp	1.New Spec	2.Existing Spec				
Price	Pr	1.Set price	2.Agreed price				
Delay	De	1.Internal	2.External				
Due Date	DD	Date to be dispatched:					
Reviewed Due Date	RDD	Above reviewed:					
Lead Time	LT	1.Hour	2.Day	3.Week			

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Automotive Industry e Business Activities

- Global
- Europe – Odette (independent interface between national bodies)
- UK - SMMT

Odette Aims

- “To develop tool and recommendations that improve the flow of goods, services product data and business information across the whole supply chain, throughout the entire product life cycle”

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Odette Activities

Functional Committees in:

- **E-Business Communications**
- **Logistics Management**
- **Engineering data exchange**

Work in the three areas are carried out by Project Groups (supported by national bodies – SMMT – VDA – GALLIA etc.)

e.g. - in CAD - CAM

Product Data Exchange

Exchange Management of Technical Data

Product Data Quality

XML

etc.

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Examples of involvement in workgroup activities can be found in the Proceedings of the Odette 2002 November Conference held in Berlin

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ICT Project Developments

- The progress being made by vehicles manufacturers and tier one suppliers is leaving the UK metalforming industry way behind

- The SMMT are actively promoting greater upper tier integration and are aware of the need for sub tier one suppliers to be involved

- What is required is a low cost route map with hand holding assistance to help lower tier suppliers become networked

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ICT Project Developments (cont)

- Future work will address the issue of sub tier one involvement by identifying relevant Odette supported project activities

- These will be prioritised for their relevance and importance across the supply chain and provide specifications for sub tier one requirements within the EDI environment

- The specifications will form the basis of possible future commercial ASP facilities (at affordable cost) to allow SME entry into any EDI automotive supply chain

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ICT Project Developments (cont)

- Clearly, the SME specific facilities will be applicable to any automotive supplier from glass to upholstery
- Companies who might wish to take part in this ICT activity are very welcome to apply
- The benefit will be to have access to the Odette project group work (through the SMMT) and be able to input their own requirement for inclusion in the ASP output
- This is the future and the metalforming community can have a place

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Conclusions

- **The successful exchange of technical data is easy to achieve – only people and systems make it difficult**

- **The ICT project seeks to identify from the automotive sector the fundamental factors of EDI to allow a low cost metalforming industry involvement**

- **Companies wishing to be involved in the ICT project please apply**

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Thank you for your kind attention