



JOINING
INNOVATION
AND EXPERTISE

Why, not what The role of the sci- tech library in safety critical decision making

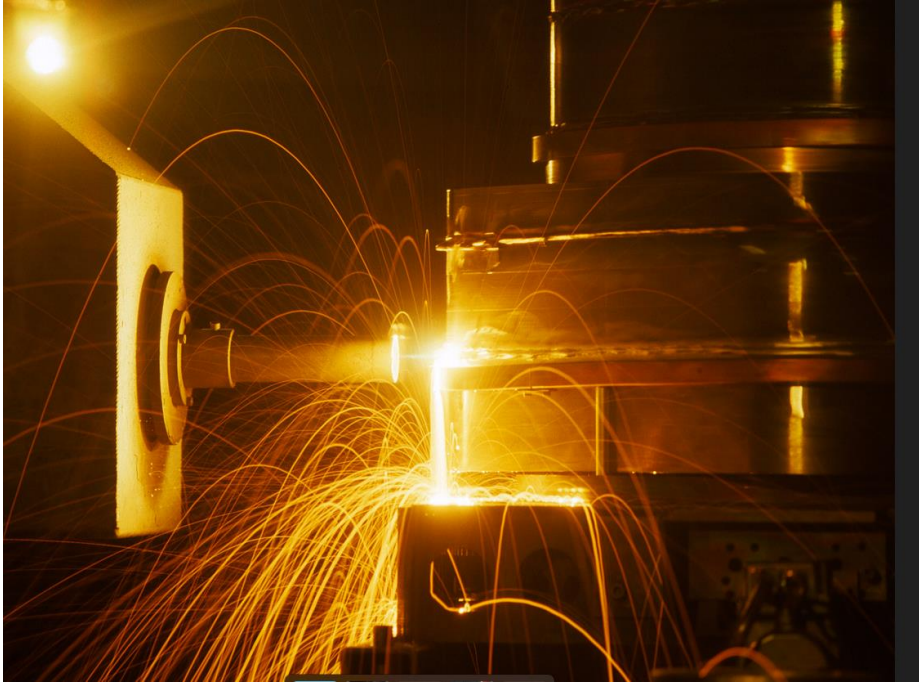
Paul Jones, Manager of Information & Knowledge Services, TWI Ltd

Agenda

- Introductions
- TWI
- Value
- Trust
- AI

Intros

- Paul Jones
- Qualified archivist but never practised
- Corporate information management. Shell, Enron, then TWI
- 22 years at TWI



- Industry run, consultancy and R&D in materials performance, joining and structural integrity
- Established 1946, the first Cambridge spin-out
- Unique expertise and information

Weld failure & brittle fracture



What we do

- Compile databases, run a library and archive service
- Expert searching
- Research for researchers. Market analysis, technology intelligence, horizon scanning

Example requests for search

Client	Requirement	Benefit – What our work enabled
Aircraft manufacturing prime	Data on mechanical properties and hydrogen embrittlement of FeNi36 at 20-373K	Informed material selection and design of aero structures
National atomic energy regulator	Data on elevated strain rate on mechanical properties of ferritic steels	Confirmed the engineering design of radioactive waste storage boxes
Global oil and gas major	TRL and market assessment for vertical axis wing turbines.	Contributed to client's net zero strategy
Fusion energy developer	Information on the state of the art for welding oxide dispersion-strengthened alloys.	Informed choice of welding technique for fabrication of critical components.

Our search commands look like this

(TITLE ("diffusion bond*" AND titanium) AND TITLE-ABS-KEY (strength OR hardness OR fatigue OR "mechanical propert*" OR "tensile propert*") AND NOT TITLE-ABS-KEY (dissimilar OR steel*))

- (TITLE-ABS-KEY ((*316l OR "*316 L" OR s31603 OR "S 31603" OR "1.4404") W/5 (copper OR "CU OFE" OR "CuOFE")) AND TITLE-ABS-KEY ((gta OR gtaw OR tig OR "gas tungsten" OR "tungsten inert") W/3 weld*))

Know your value...why we do what we do

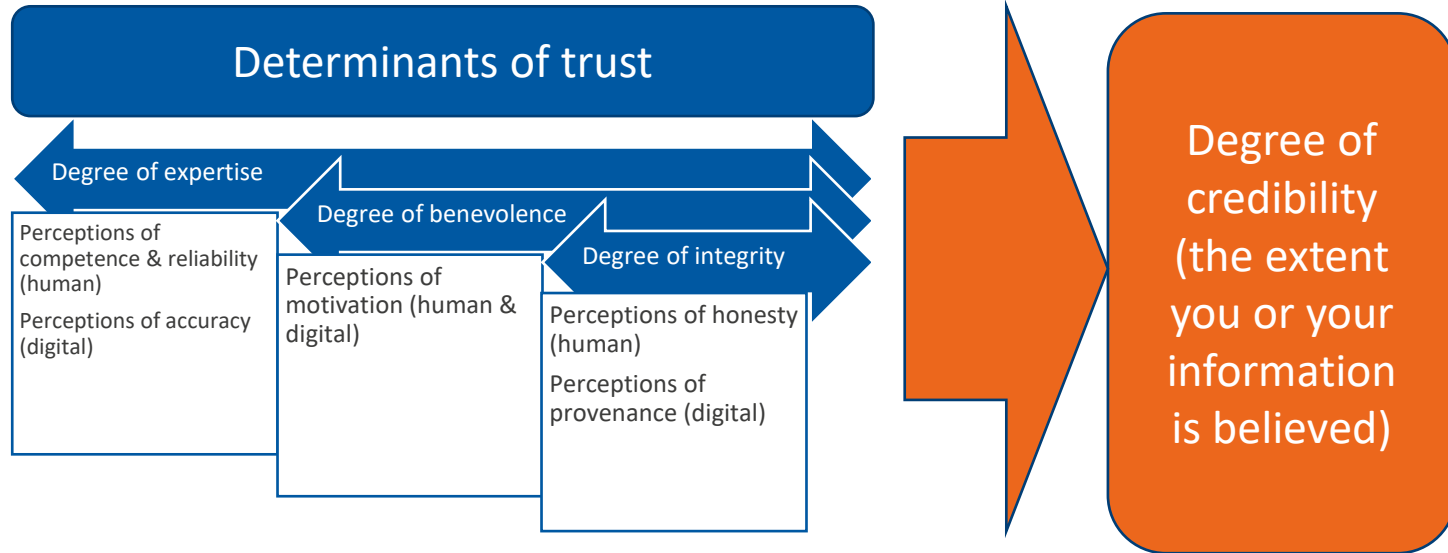
- Alignment with strategy
- Value is *not what* we do *but why* we do what we do

*We enable better safety-critical decisions by making information **trustworthy** and **discoverable***

Why is trust important?

- **When the client's issue involves risk to life and \$\$\$\$ they need to be able to trust both the expert's advice and the information its based on**

What is trust?



Trustworthy information

- Premium and specialised sources
- Comprehensive metadata, editorial rules consistently applied
- Controlled terminology for subject tagging (IIW thesaurus)
- Professional staff knowledgeable of the technical domain
- Expert search, ranked for relevance only
- **Combined, this gives comprehensive, definitive and trustworthy information**

TABLE OF CONTENTS

Acknowledgements

Foreword

Introduction

Alphabetical listing of keywords and relations

Hierarchical listing of keywords

Keywords deleted, added and altered since the 3rd Edition

American (US) terminology

Bibliography

Trilingual collection of terms: English, French, German

ACKNOWLEDGEMENTS

Production of this latest revision of the Thesaurus would have been impossible without the work done in preparing previous editions, in which notable contributors were (in alphabetical order): Dipl.Ing. H Barthelmeß (Germany), Mr R T Bryant (UK), Mr R Plencner (Czechoslovakia), Mr C Poisson (France), and Mr H Vinter (Denmark). Contributors to the present revision, again listed alphabetically, have included Mr P M Adams (UK), Mme N Fauriol (France), Dr C Mayer (France), Dipl.Ing. D Rippegather (Germany) and Dr H G Ziegenfuss (USA).

CRACKING

SC: 09 Defects, loading and service conditions

SN: (Use more specific term if possible)

UF: Crack susceptibility

Cracks

Fissures

Weld cracking

UFA: End cracking

Type IV cracking

NT: COLD CRACKING

CRACK PATTERN

FATIGUE CRACKS

HOT CRACKING

INTERCRYSTALLINE CRACKS

LAMELLAR TEARING

LIQUATION CRACKING

LONGITUDINAL CRACKS

MICROCRACKS

REHEAT CRACKING

SOLIDIFICATION CRACKING

TOE CRACKING

TRANSVERSE CRACKS

UNDERBEAD CRACKING

UNDERCLAD CRACKING

BT: DEFECTS

RT: CRACK INITIATION

CRACK PROPAGATION

FAILURE

FRACTURES

METALLURGICAL WELDABILITY

RESTRAINT

SPALLING

THERMAL SHOCK

WELDABILITY

WELDABILITY TESTS

Cracking tests (fracturing of welds)

SN: (Use more specific term if possible)

USE: FRACTURE TESTS

Cracking tests (tests of weldability)

USE: WELDABILITY TESTS

Cracks

SN: (Use more specific "cracking" or "cracks" term if possible)

USE: CRACKING

A weapon of mass deception or power steering for the mind? Can we trust AI?

- No, not blindly
- AI is a 'black box'
- **AI is fundamentally different to 'normal' computing**

Making AI work for TWI – Rules of engagement

Compliance

- Does the application comply with data security policies? Go/no go decision

Alignment

- Does the application....
- Support strategy? Is it reliable & secure? human centered? transparent & explicable?, accountable & governed?

Oversight

- Cross-discipline AI governance group has oversight role for life cycle of application and is a community of practice

And finally...a New York Times headline, June 2023

“Researchers and industry leaders have warned that A.I. could pose an existential risk to humanity...
but they’ve been light on the details.”

