



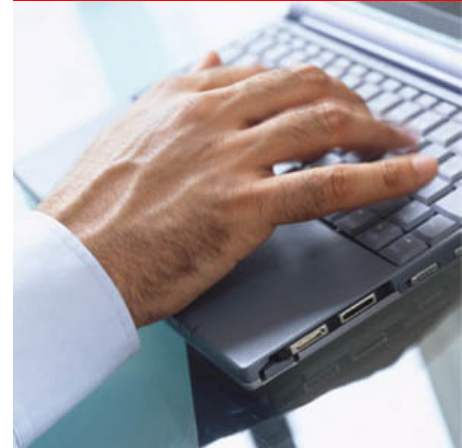
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The Evolution Of Coding Technology

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ORACLE®
HEALTH SCIENCES

Agenda



- Why do we code ?
- Coding requirements
- A journey through coding (1993-present)
- The future
- Questions

Why do we code clinical data.....

Adverse Events	
Has the patient experienced an	
AE no.	Adverse Event (diagnosis (if known) or signs/symptoms)
1	Headache

Adverse Events	
Has the patient experienced an	
AE no.	Adverse Event (diagnosis (if known) or signs/symptoms)
1	Head Pain

Adverse Events	
Has the patient experienced	
AE no.	Adverse Event (diagnosis (if known) or signs/symptoms)
1	Pain In Head

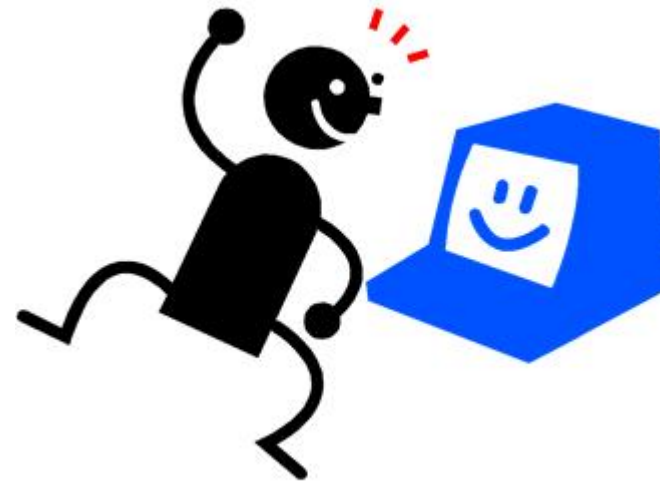
Adverse Events		
Has the patient experienced any Adverse E		
AE no.	Adverse Event (diagnosis (if known) or signs/symptoms)	Start date and time (24 hr clock)
1	頭痛の種類	25/12/2020

Why do we code clinical data.....

- Validate/clean the source data
- Understand our safety profile
- Identify/understand interactions
- Report our data
- Secure approval
- Detect potential signals and manage risk

Coding requirements

- Timely
 - Consistent
 - Controlled
 - Automated
 - Manageable
 - Not a burden on our business
- How has technology helped ?





Arthur C. Clarke (1917–2008)
"Profiles of The Future", 1961
(Clarke's third law)

“

Any sufficiently advanced technology is
indistinguishable from magic.”

The World in 1993.....

- Bill Clinton becomes 42nd President of the USA
- Buckingham Palace opens to the public
- Czechoslovakia divides into the Czech Republic and Slovakia
- Nelson Mandela and F W de Klerk win Nobel Peace Prize
- I was working for Fisons Pharmaceuticals



FISONS

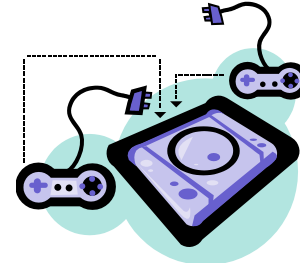
1993

- A Manual Job
 - Data Managers
 - Working from data listings
 - Using published encyclopaedias
- The first hint of sophistication
 - SAS Programs
 - Lookup against internal dictionary
 - Fisons Adverse Reaction Terminology

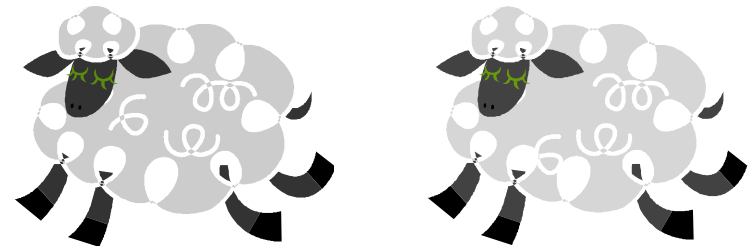


The World in 1996.....

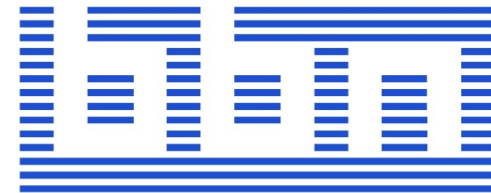
- The Nintendo 64 Games Console was released



- Dolly the Sheep was 'created'



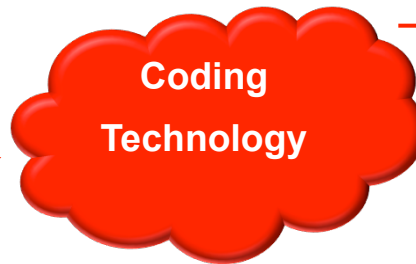
- I was working for BBN Software Products



1996

- Arrival of the Coding technology
- Autoencoders & Interface for searching electronic thesauri

Adverse Events		
Has the patient experienced any Adverse		
AE no.	Adverse Event (diagnosis (if known) or signs/symptoms)	Standard
1	Headache	



Code	Term
0001	HEADACHE
0002	NAUSEA

Code	Synonym
0001	HEAD PAIN

Stopword	
THE	
PATIENT	
HAD	

Headache = 0001 HEADACHE

1996 – Progress (of sorts)

- Ability to use electronic thesauri such as WHO-DD & ICD-9
- Application focused, not role focused
 - Clinical Data Management Systems
 - Drug Safety Systems
- Data coded by different departments using different technologies
 - Reconciliation requirement
- How to provide for a Central Coding department ?

The World in 1998.....

- The first Harry Potter book was published
- Viagra was released
- Google was founded
- I was working for Clinsoft



1998 – Getting sophisticated

- Tools for Central Coding
 - Allowing coding across clinical trials
 - Providing data query facilities
 - Support for new hierarchical dictionaries such as MedDRA
 - Tuneable autoencoding algorithms
 - Word Stemming
 - Punctuation removal

Adverse Events		
Has the patient experienced any Adverse E		
AE no.	Adverse Event (diagnosis (if known) or signs/symptoms)	Start I dd/mm/yy and T (24 h clock)
	Neoplasm of skin of upper limb, includes shoulder	/ :

=

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The World in 2006.....

- The Human Genome Project published the last chromosome sequence
- Heatwave in Europe (no, really, there was)
- World Cup held in Germany. Who won?
- I was working for Phase Forward



PHASE•FORWARD™

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2006 – Crossing Business Boundaries

- Technology Change
 - Web-based
 - Supporting multiple stake-holders
 - Crossing Business Boundaries
 - Fully flexible searching mechanism (LLT-SOC)
 - Contextual information to assist the coder
 - Route Of Administration
 - Indication
 - Multiple concurrent thesauri support
 - Designed for more complex business requirements, such as a CRO

The World in 2008.....

- Barack Obama is elected 44nd President of the USA



- Apple launches the “App Store”



- Price of Oil went beyond \$100 a barrel



- I was still working at Phase Forward

PHASE•FORWARD™

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2008 – Dealing with diversity & change

- Global Trial Support
 - アデノウイルス結膜炎
 - アデノウイルス結膜炎

= Adenoviral conjunctivitis

- Impact Analysis & Up-versioning
 - Comparing Thesauri
 - Detecting changed codes in historical data
 - Interface for managing and auditing changes



Soren Kierkegaard
Danish philosopher (1813 - 1855)

“Life can only be understood backwards; but it must
be lived forwards.”

What has been achieved ?

- Timely ✓ Yes
- Consistent ✗ Not necessarily
- Controlled ✓ Yes
- Automated ✓ Yes
- Manageable ✗ Partially
- Not a burden on our business ✗ Work to do

The Future – my personal view

- Organisations viewing coding a core capability of their future clinical platforms
- Requirement for a single source of coding algorithms, dictionaries and supporting information within the business
- Multiple interfaces providing the appropriate capabilities to the appropriate users on the appropriate data at the appropriate time:
 - During data capture
 - During data storage and maintenance – Warehousing
 - During Safety/Risk Management



Questions ?

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