Project Controls Expo – 22nd November 2018
Melbourne Cricket Ground

Distributed data capture to manage complexity
Mark Heath

About the Speaker

Founder and Managing Director at UniPhi (Aus) Pty Ltd

❑ Founder and Managing Director of mbh training – PM Training RTO since 2003

❑ Fellow of CPA Australia

❑ Registered Assessor with AIPM for 13 Years to 2016

❑ Currently supporting over $31bn infrastructure spend

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About the Topic

- Complexity Theory

- Big Data versus Centralised Data

- Project Controls Data Analytics – The Possibilities

- Artificial Intelligence – The Future

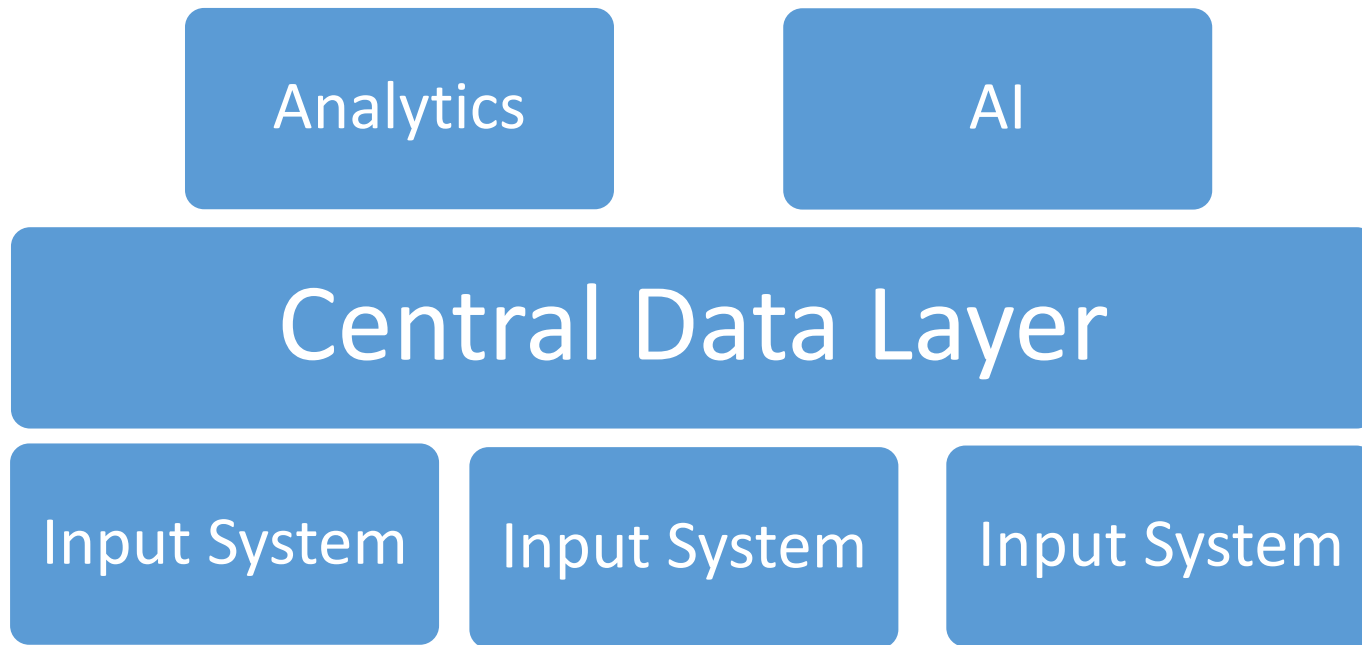- Implications

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Complex Adaptive Systems - Properties

- Hierarchy

- Small changes in initial conditions can have large changes in outcomes

- Emergence as opposed to pre-determined

- Self organisation

- Overall behaviour of the system is the result of a large number of decisions made daily
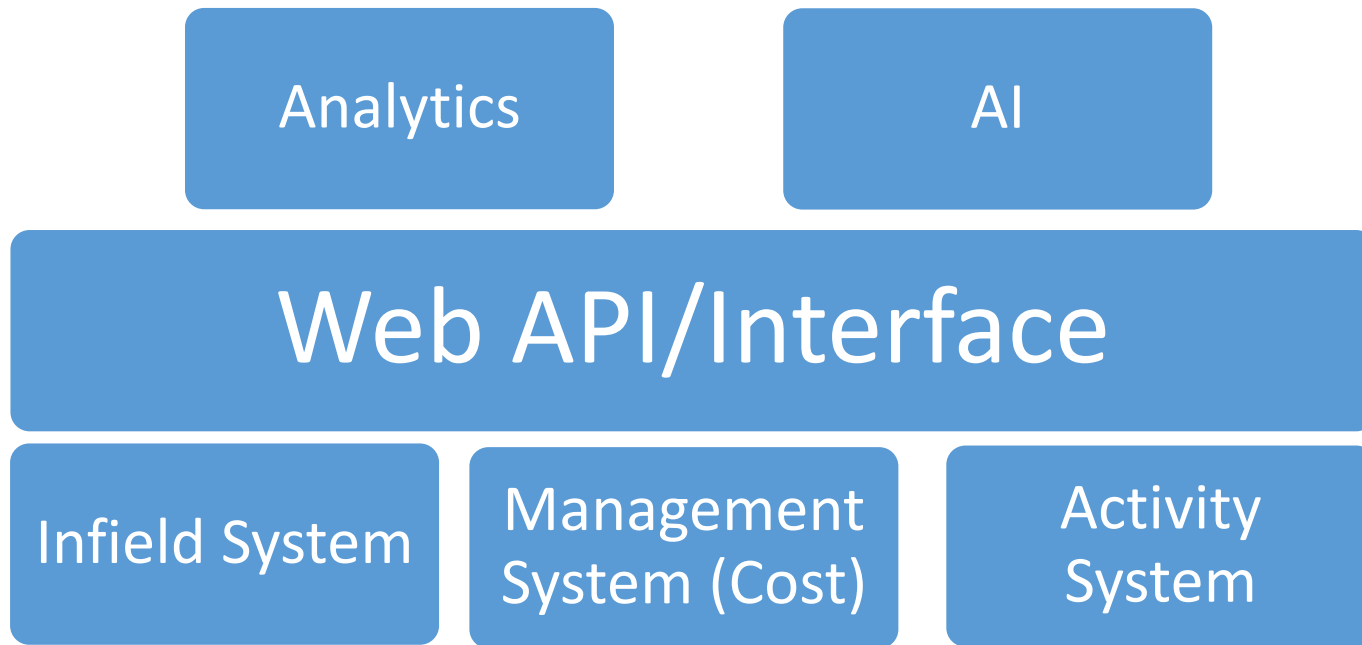
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Centralised Data – Example 1 P6 Schedule

- Few Updaters = Few Data Points

- Feed of statistics from contractors

- Background causes and conversations unknown

- Deep data stored in disparate systems

Distributed Data Capture – Unified data model

Analytics

AI

Central Data Layer

Input System

Input System

Input System

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Distributed Data Capture – Unified data model

Analytics

AI

Web API/Interface

Infield System

Management System (Cost)

Activity System

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Data Types

- Activities

- Issues

- Risks

- Documentation

Data Sub Types

- Photos

- Conversations

- Ratings

Meta Data

Sector

Type

Meta Data

Location

Role
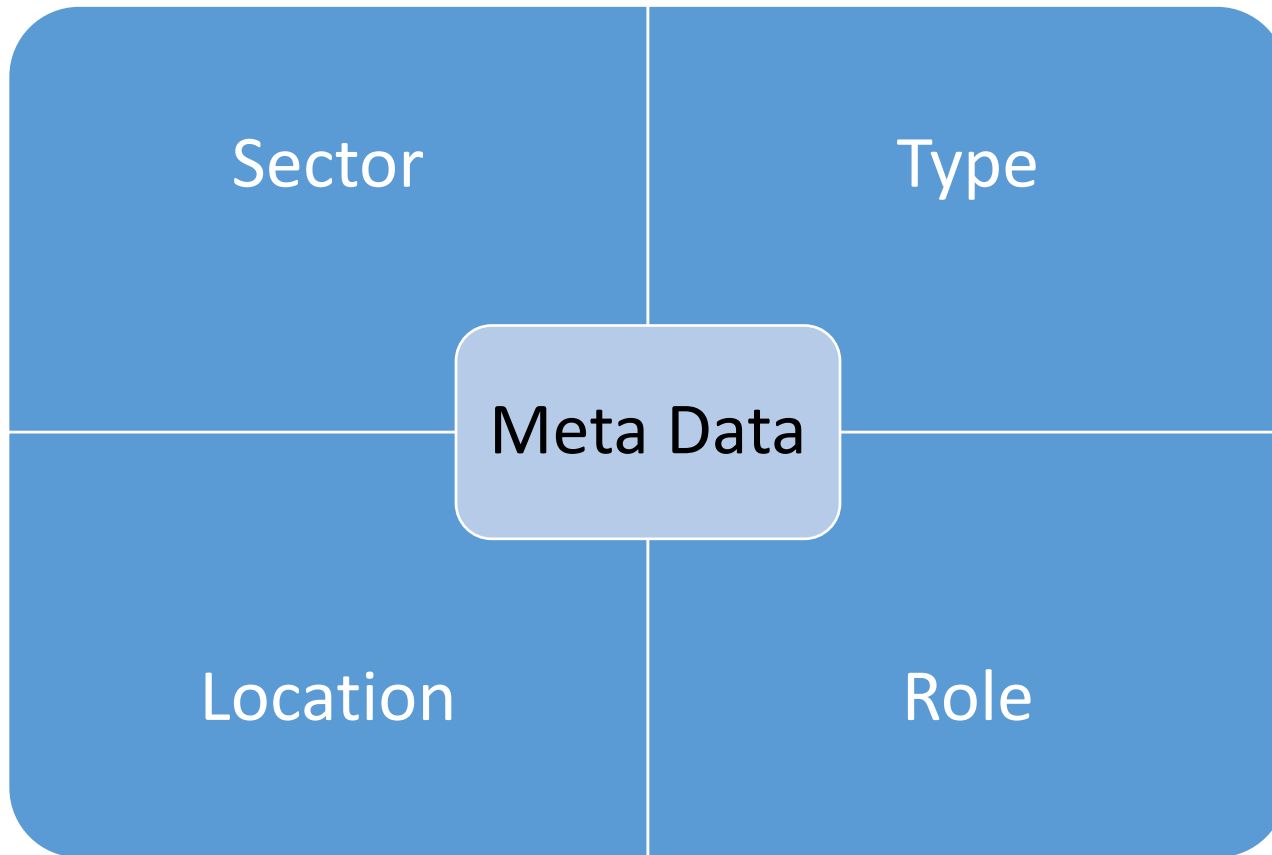
Distributed Data Capture – Growth Case Study

Project	#	Resource	#
Projects	339	FTEs	125
Design Stages / Project	3	Comments / Day	10
Header Steps / Stage	12	Days / Year	220
Activities / Step	6	Data Points	275K
Comments / Activity	4		
Activity Data Points	291K		

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Distributed Data Capture – Growth Case Study

Project	#
Project Data Points	291k
Meta Data / Project	20
Meta Data / Stage	10
Meta Data / Activity	20
Combinations Matrix	582M
Avg Words / Activity	20
Words	5.8M

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Project Controls Data Analytics – Now

- Number of times a date changes

- Variations per RFI and comments per RFI

- Benchmark duration feedback loops through historical analysis of actuals

- Costs per activity per other class of meta data

Artificial Intelligence

- Word pattern matching for early warning

- Past performance to predict future performance

- Optimal portfolio selection (resource constraints v outcomes required)

- Data cleansing – timesheet data v task activity

Implications

- Goal is to have deep data sets

- Streamline collection of activity information and collaboration into a central source

- Closed systems slow down collection of data

- New technologies are allowing for live connections to distributed data systems

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Closed v Open Examples

Closed   Open