

Envision.

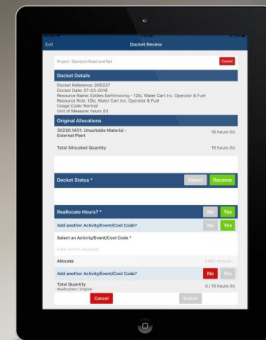
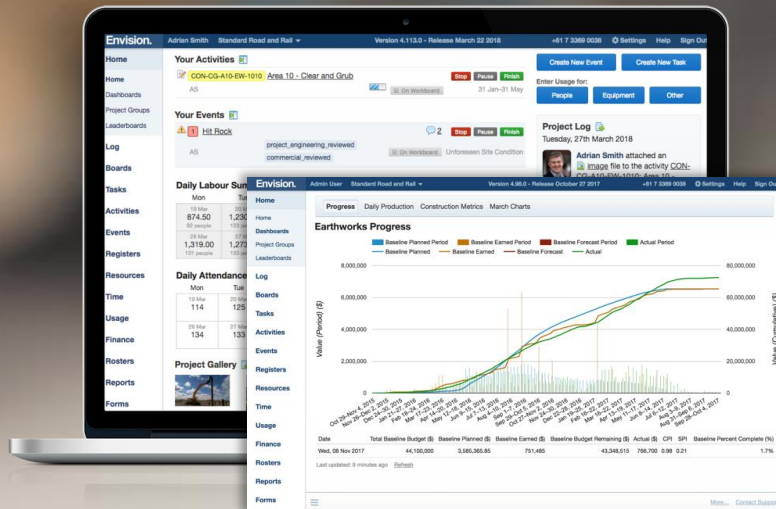
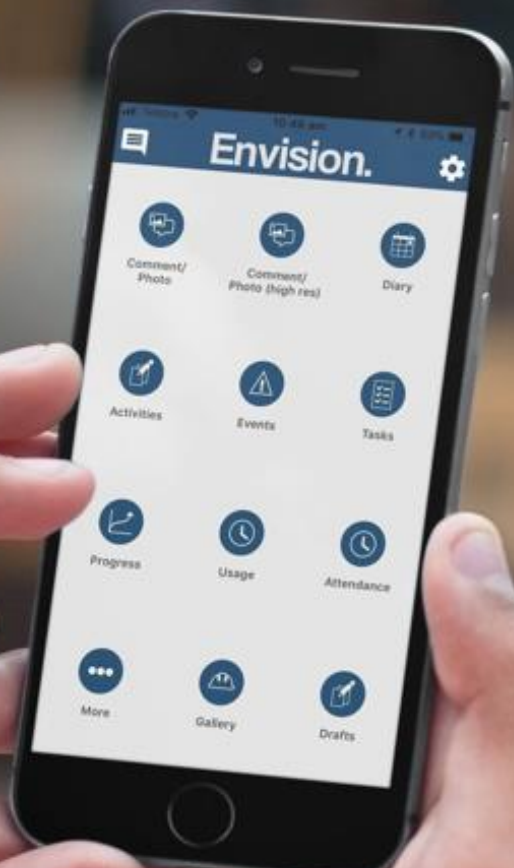
Construction Data

QMCA Breakfast Briefing



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Field-based construction delivery platform,
connecting project leaders with real-time
insights and visibility of project performance.



Proudly designed and supported in Australia



Envision projects



Key project history

**>270
projects**

**+\$20 billion
in project value**

**>150km
road**

**>1,150km
rail**

**>1,200MW
power**

**>11,400km
pipeline**

Mondarra Gas
Compression
Facility
Enerflex

Upstream
Compression
Thiess + QGC

Mine Construction
and Defect Liability
Royhill

Gold Coast
Light Rail
CPB

Brisbane Parallel
Runway
CPB + BMD

CR2SM
Seymour Whyte +
Fulton Hogan

M4 M5 link
tunnels
LendLease



2011

2012

2013

2014

2015

2016

2017

2018

2019



Caval Ridge
Coal Plant
Thiess



Ichthys LNG Control
Buildings
Leightons



APLNG Sustaining
Infrastructure
CPB + MPC



WestConnex
New M5
CPB + Dragados + Samsung



Port Moresby
Power Station
Clough



Oyu Tolgoi
(Mongolia)
Clough

Construction industry challenges



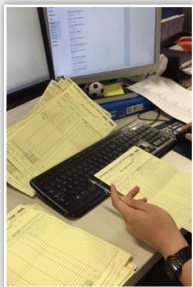
Poor productivity – labour productivity has not kept pace with overall economic productivity

McKinsey & Company



Performance challenges – cost and schedule overruns are normal

McKinsey & Company



Digital adoption - amongst the least digitalized of all industries

McKinsey & Company



Cost of disputes – Impact in Australia more than \$7B annually

CRC Construction Innovation

Industry failures



QLD BUSINESS

Qld pipeline firm iPipe hits

The future of 200 workers hangs in the balance as the company hit the skids, owing creditors

THE future of 200 workers hangs in the balance as the company hit the skids owing creditors about \$19 million.

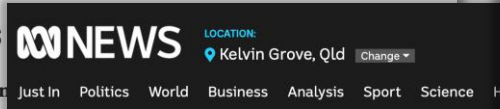
The company, which constructs and maintains infrastructure, went into administration last month owing money to the Australian Taxation Office and subcontractors.

[Builders' \\$500k tax debt](#)

[Tradies last to be paid](#)

[Subbies duped](#)

Administrators Ernst and Young say they are still working on the company after fielding more than a dozen expressions of interest.



Engineering firm RCR Tomlinson goes into administration soon after raising \$100m

By business reporter [Stephen Letts](#)
Updated 23 Nov 2018, 9:39am



Major government contractor York Civil ceases trading

Updated 13 Aug 2018, 4:45pm

Construction and engineering company York Civil has ceased trading, leaving 188 employees out of work.

The company told employees and contractors on Monday morning.

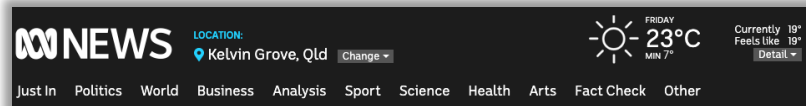
A creditors meeting will be held on Thursday.

York Civil employed 136 workers in Adelaide, 31 in NSW, 18 in Western Australia and three in Queensland.

In a statement, administrator Ferrier Hodgson said the decision to cease the company's operations had been made because of insufficient cash resources and the inability to find a buyer for the company.

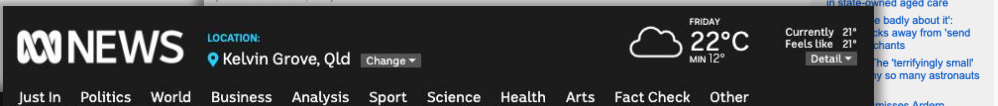
The Adelaide-based business is currently working on major construction projects around Australia, including the Perth Stadium footbridge in Western Australia, the \$800 million Torrens to Torrens road upgrade, North Terrace tram extension and Main South Road upgrade in South Australia, and the Pacific Highway in NSW.

murder
Should everyone know if your coastal home is at risk of flooding due to climate change?



Creditors vote to put Forge Group into liquidation

Updated 18 Mar 2014, 5:45pm



Major government contractor York Civil ceases trading

Updated 13 Aug 2018, 4:45pm

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murder
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PHOTO: York Civil is involved in major construction projects around Australia including the new Perth Stadium bridge. (Supplied: John J Zylstra)

RELATED STORY: Major infrastructure contractor York Civil goes into administration

RELATED STORY: Stadium bridge builder leaves subcontractors owed hundreds of thousands of dollars

TOP STORIES

- Clive Palmer paid just \$1 for Queensland Nickel, court told
- Ice-smoking driver jailed for seven years for killing mother and daughter
- French reporter says his arrest will feature in documentary
- How to spot an online scammer on a dating site
- Sabrina Leka's father faces court hearing from hospital bed charged with daughter's murder
- Toddler's baggage carousel ride into bowels of world's busiest airport caught on camera
- Gangland figure wipes away tears as court grants freedom due to Lawyer X
- Corruption watchdog boss stands aside from probe into Deputy Premier
- Four teens charged over alleged homophobic attack on a London bus
- Casinos keep 24-hour trading, exempt from ID scanners to help make Brisbane 'new world city'
- Scientists are stumped about why this stump is still alive
- Josh Frydenberg's electorate result to be challenged in High Court
- Sediment is causing the Great Barrier Reef significant harm, but a fix is contentious

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**Good news
is bad news fast**



BIG DATA

**DATA
ECONOMY**

END FOR OIL?

IS DATA THE NEW OIL?

**REAL TIME DATA
CHANGES CONSTRUCTION**

MOST VALUABLE RESOURCE





Victoria Park
Golf Complex

7 - 12 mins
4.6 km

7 - 12 mins
4.1 km

9 - 16 mins
4.6 km



Officeworks



Contact



Store Locator



Login



Cart

0

Search for a product

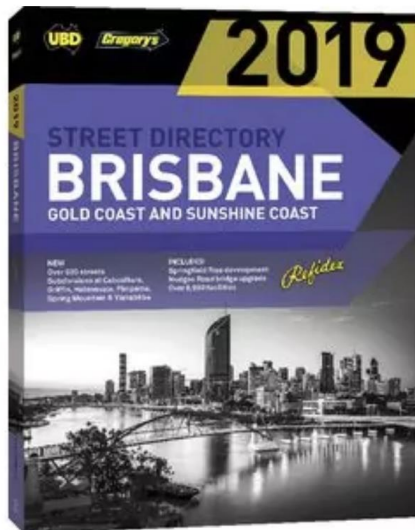


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UBD 2019 Brisbane Street Directory 63rd Edition

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1



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Construction Data

Unplanned
Site
Conditions

Weather
Station
Records

Equipment
GPS

Timesheets

Survey
Data

Weigh-Bridge
Records

Equipment
SMU Hours

Equipment
Breakdowns

Program
Actuals

Material
Test Results

Load
Counts

Site
Attendance

Subcontractor
Dockets

Safety
Inspections



Construction Information

Earned Value

Cost and
Production
Rates

Percent
Complete

Weather
Delay
Claims

Equipment
Utilisation

Safety
Exposure
Hours


Commercial
Claims

Progress
Claims

Daily Reports

CPI
SPI

SUPERINTENDENT'S DAILY REPORT		No. _____
Project _____	Job No. _____	
Superintendent _____	Date _____	
TODAY'S WEATHER CONDITIONS AND TEMPERATURE		
<div style="display: flex; justify-content: space-between;"> High _____ Low _____ Comments _____ </div> <div style="margin-top: 10px;"> Actual _____ </div>		
BRASSFIELD & GORRIE EMPLOYEES ON SITE		
LABORER _____	SUPERINTENDENT _____	
CARPENTER _____	CLERK _____	
CONCRETE FINISHER _____	FOREMAN _____	
OPERATOR _____	FIELD ENGINEER _____	
PIPELAYER _____	MECHANIC _____	
MILLWRIGHT _____		
TOTAL BRASSFIELD & GORRIE EMPLOYEES		<input style="width: 50px; height: 20px;" type="text"/>
SUBCONTRACTOR & SUB-SUBCONTRACTOR EMPLOYEES ON SITE		
Company Name _____	No. _____	Company Name _____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
TOTAL SUBCONTRACTOR EMPLOYEES <input style="width: 50px; height: 20px;" type="text"/>		
TOTAL ALL PERSONNEL ON SITE <input style="width: 50px; height: 20px;" type="text"/>		
LAST ACCIDENTS _____		

[illegible]

device
(message)

Gate Attendance (CSV Log)

Envision.

Data Maturity



Paper



**Scanned
Handwriting**



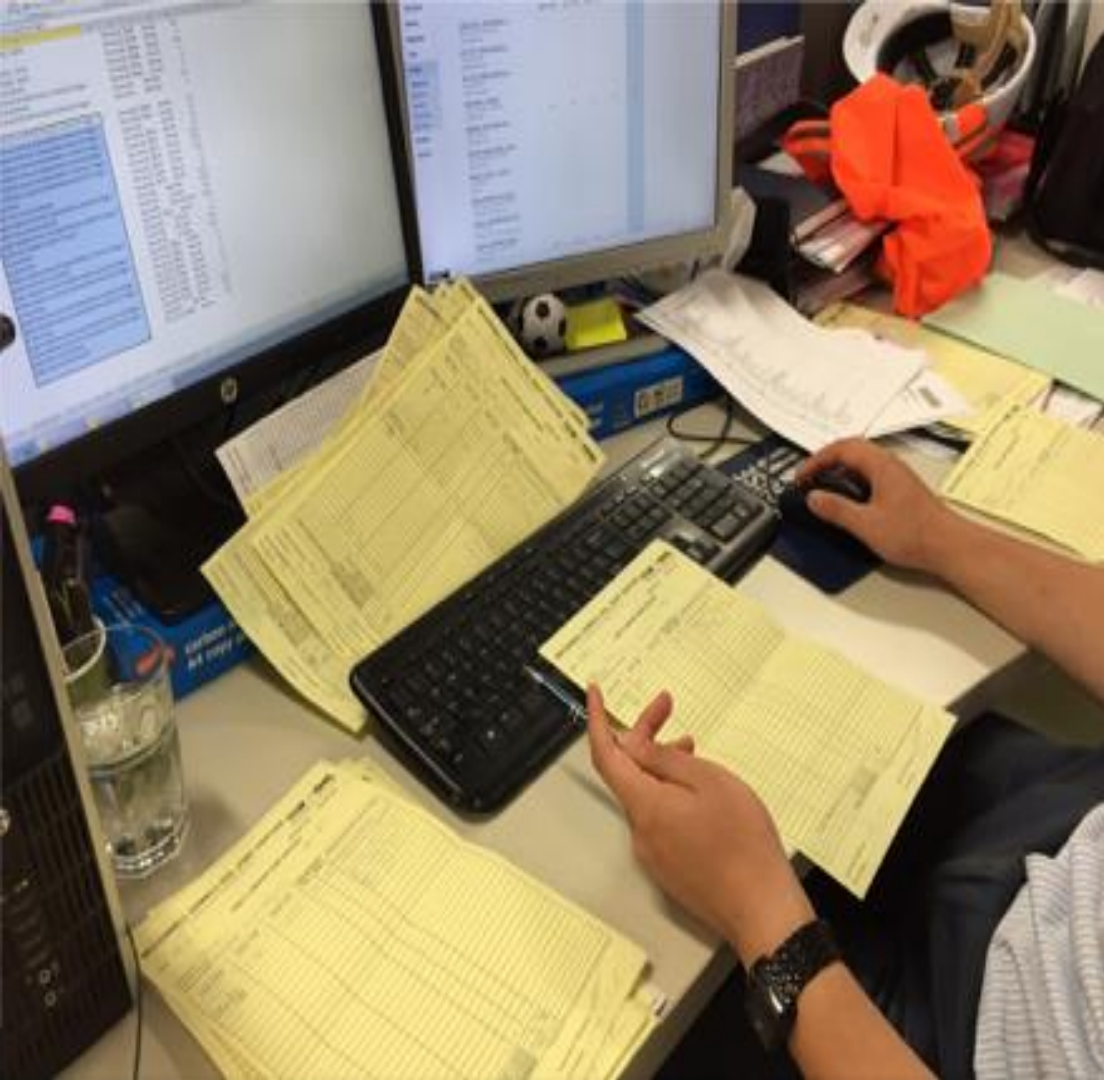
**Free
Text**



**Structured
Data**



**Self-Describing
Data**



Senior Project Engineers are spending 70% of their end of month effort determining cost position and accruals.

Leaving only 30% of time for forecasting and improvement planning for next month

Site Docket

Site

Equipment
Details

Pre-Start
Checks

Safety
Reminders

Remediation
Actions

Signature

Excavator Pre-Start Inspection Checklist & Defect Report

Site Address:			
Plant:		Operator:	
Rego:		Hours/kms	
Walk Around Inspection - Mark all boxes, Put NA if it does not apply			
CHECK	Y/N	CHECK	Y/N
Hydraulic Cylinders (lub. & checked)		Transmission oil	
Hydraulics (No leaks or damage)		Coolant level & leaks	
Quick Hitch and Pins (Functional)		Hydraulic Oil	
Seat & Seat belt (Functional)		Slew Gear Gearbox Oil	
Safety Bar		Rotating Beacon	
FOPS and side mesh		Battery (Brackets Terminals & Levels)	
Track Chain & Plates (tension, damage)		Clean windows	
Fluid leaks		Attachments (Check for Damage)	
Engine oil (level)		Warning Decals	
Operational Check - Mark all boxes, Put NA if it does not apply			
CHECK	Y/N	CHECK	Y/N
Steering system (steers well)		Gauges (Operating correctly)	
Park Brake (Holds on incline)		Hand Controls (Operate correctly)	
Quick Hitch		Lights	
Creep (Non when controls in neutral)		Cab interior - clean, tidy	
Hydraulic Lockout		Slew (Full travel, Smooth operation)	
Foot Pedals (Operate correctly)		Boom Arm (Extends to full Travel)	
Ground Engaging tools		Dipper Arm (Tilts & Crowsds to full travel)	
Precleaner (clean)		Foot Pedals (Operate Correctly)	
Horn & reverse alarm		Auxiliary Hydraulics	
Remember to:			
1. Conduct a "walk around" inspection of the machine after each scheduled break			
2. Check that brakes and steering are operating correctly when you first start moving			
3. Keep the cab and access ways clear of all obstruction			
4. Use horn signals when starting from a parked position			
5. Ensure seat belt is correctly fastened and seat is correctly adjusted			
Actions required		Actions Taken	
Operator's Signature:		Date:	

Your Business
Name
Address
State, Postcode
Phone:
Fax:
ABN



PLANT HIRE DOCKET No. _____
ONE DOCKET - PER DAY - PER MACHINE
Client: _____

Billing address: _____

P.O. Number: _____ Date: _____

Start:		Stop:	
Lunch:		Stop:	
Start:		Stop:	
DESCRIPTION OF WORK			
Machine No. or Model	Work performed	Hours worked	
Machine attachments used			
Extras: ie Tip Fees			

Client / Representative Signature _____
It is the client's duty to ensure that all services are located and identified to the operators prior to the commencement of the work.
Client's Initials _____

Docket #

Date


Start, End &
Break Time

Allocation of
Work Performed

Cost/Rate
Adjustments

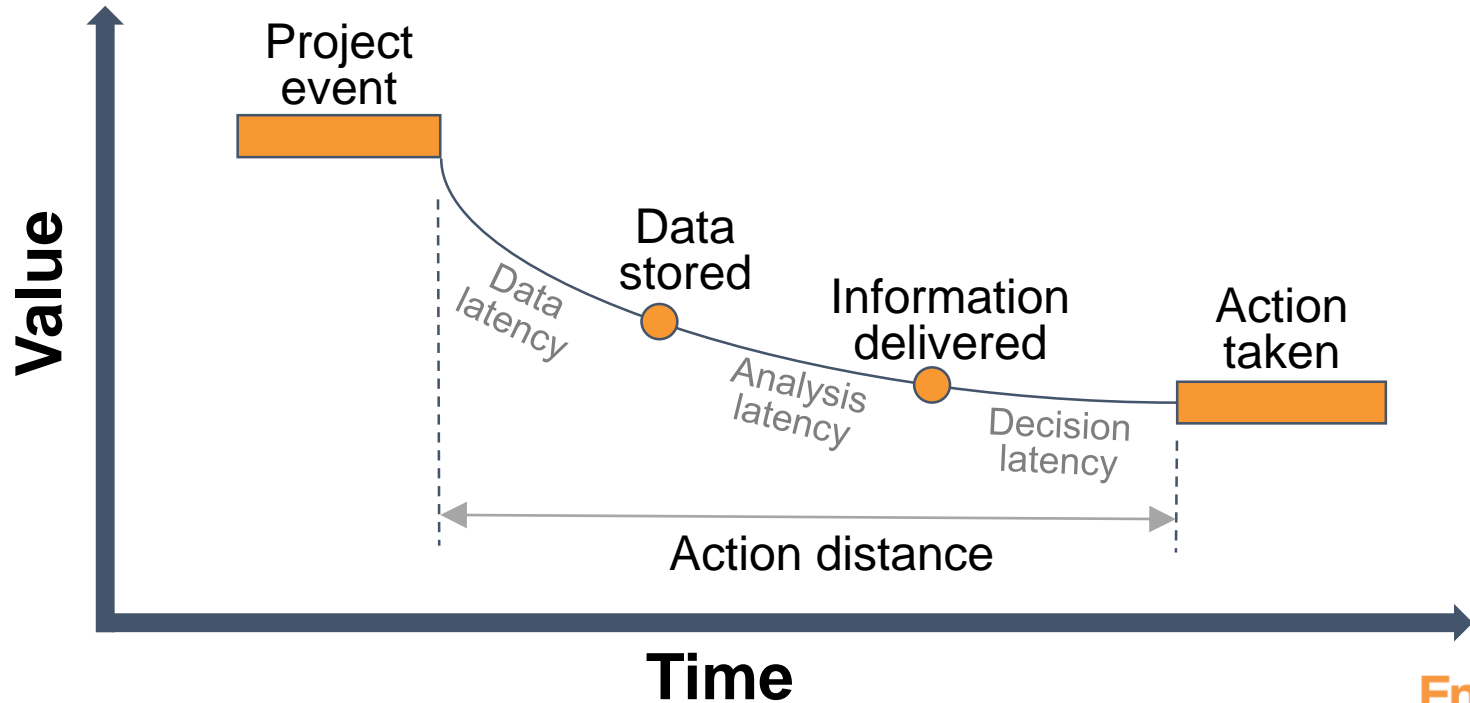
Client Approval

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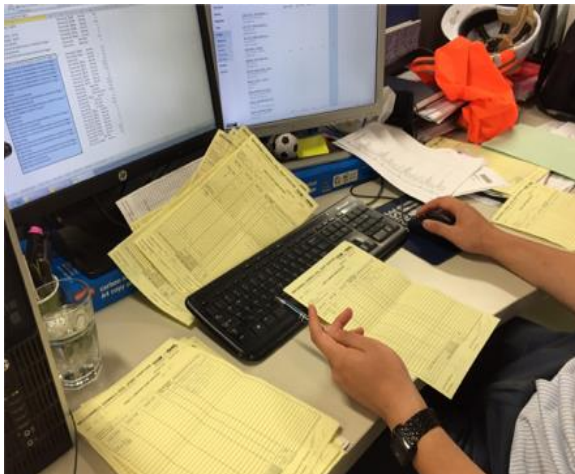
A close-up shot of a man with a beard and mustache, wearing a dark jacket, sitting in the driver's seat of a car. He has a wide-eyed, shocked expression on his face, looking slightly to the right. The car's interior, including the rearview mirror and a side mirror, is visible. The text "What just happened?" is overlaid in large white letters on the right side of the image.

**What just
happened?**

Action distance



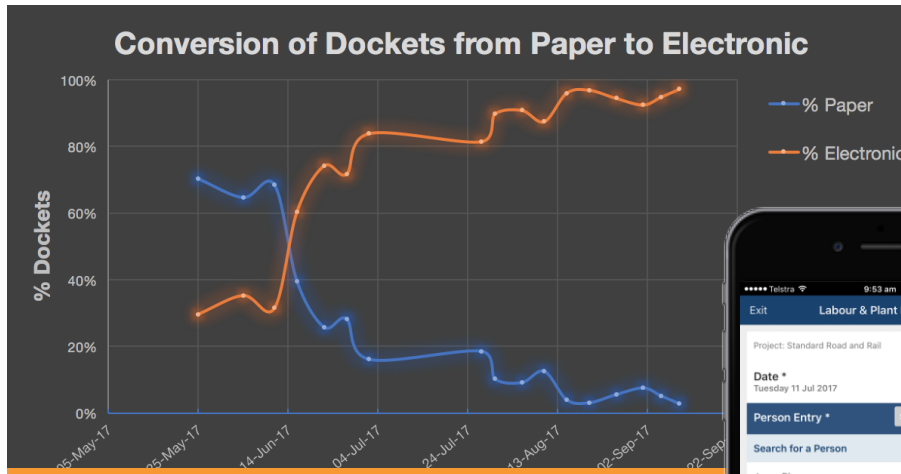
Docket transformation case study



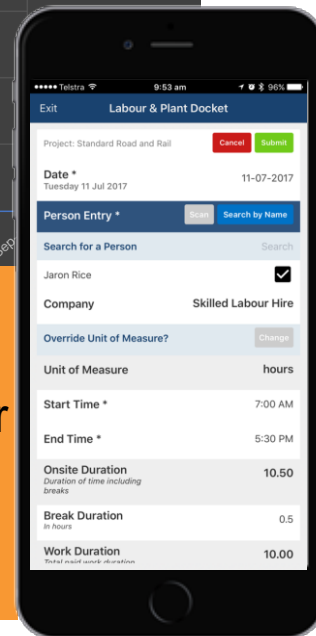
130,000
paper dockets per year



\$250M p.a. recurring
sustaining gas infrastructure



95% of dockets are
electronically generated by the
workforce, saving 110,000 paper
dockets per year and reducing
administrator head count by
8 people



Docket transformation case study

*“With electronic timesheets, you can **reliably use the data the day after it’s entered.***

The old approach meant you could be making decisions on half the data – meaning poor decisions.”

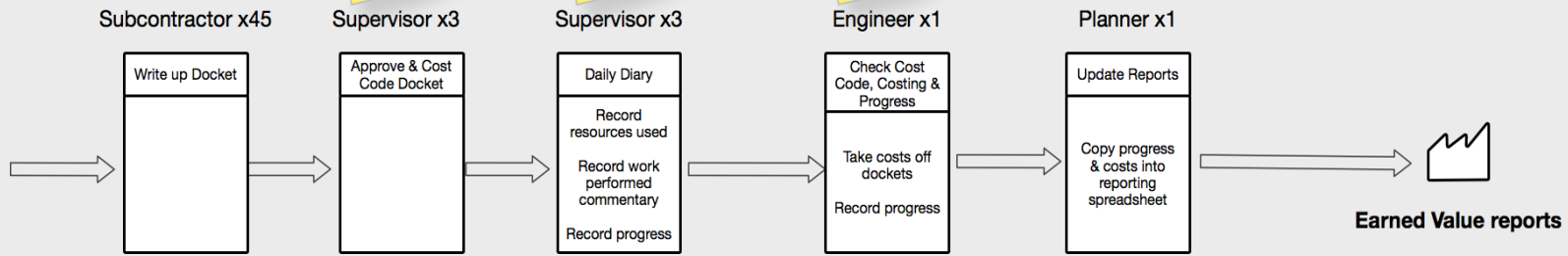
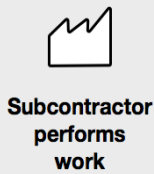
Ernie Downes
Project Controls Manager

“One of the biggest issues with our industry is poor planning. This takes a task that doesn’t require any planning away from the supervisor so they can really plan the day

*... **that planning time is priceless** for understanding the job and from a safety and quality perspective.”*

Damian Percy
Project Director

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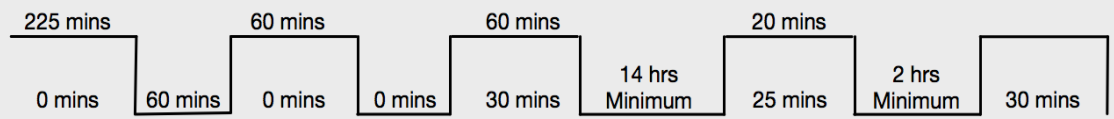
Assume 15 Dockets per Supervisor

Dockets get left in the Ute and come into the office a week late or are lost

Assume 3 Supervisors per Engineer

Value Add Time

Non-Value Add Time



C/T = 1,220 min (20.3 hrs)
Value Add = 365 min
Non-Value Add = 1105 min (18.5 hrs)
Duplicate Effort = 85 min

C/T = 5 min
Value Add = 225 min
Non-Value Add = 0 min
Duplicate Effort = 0 min

C/T = 20 min
Value Add = 60 min
Non-Value Add = 0 min
Duplicate Effort = 0 min

C/T = 30 min
Value Add = 60 min
Non-Value Add = 30 min
Duplicate Effort = 30 min

C/T = 45 min
Value Add = 20 min
Non-Value Add = 25 min
Duplicate Effort = 25 min

C/T = 30 min
Value Add = 0 min
Non-Value Add = 30 min
Duplicate Effort = 30 min

Resources used recorded in daily diary is duplication of docket records

Lose single source of truth as cost disconnected from dockets
Recording costs a second time as they were already recorded on docket



**Daily 30 - 60 mins extra
engineering time**

Decision making



Work

Site Data

Delivery Docket

Date: 20/06/16 Docket No: 250

Delivery to: ACT 100 address
To: 100 Road
ACT 100 area Code

Customer PO: 200000
Order Date: 20/06/16, 20/06/16, 20/06/16
To: 100 Road
ACT 100 area Code

Test No: 200000
Reference: 200000

Description	Quantity	Unit	Price	Amount
1. 100 Road	100	m	100	10000
2. 100 Road	100	m	100	10000
3. 100 Road	100	m	100	10000

Please retain the delivery docket as proof of purchase.

Backorders expected delivery date 20/06/16

PROJECT TITLE: PROJECT NUMBER: COMPANY NAME: DATE:

Task Title: Task Owner: Start Date: Due Date: Duration: Pct of Task Complete:

Task Number	Task Title	Task Owner	Start Date	Due Date	Duration	Pct of Task Complete
1.1	Project Charter	John M	20/07	20/07	4	100%
1.1.1	Project Charter Review	John M	20/07	20/07	2	100%
1.2	Research	John M	20/07	20/07	7	100%
1.3	Requirements	John M	20/07	20/07	7	100%
1.4	Stakeholders	John M	20/07	20/07	7	100%
1.5	Outcomes	John M	20/07	20/07	7	100%
1.6	Project Initiation	John M	20/07	20/07	7	100%
2	Project Definition and Planning	John M	20/07	20/07	7	100%
2.1	Scope & Goal Setting	John M	20/07	20/07	7	100%
2.2	Task Management	John M	20/07	20/07	7	100%
2.3	Communication Plan	John M	20/07	20/07	7	100%
2.4	Project Launch and Execution	John M	20/07	20/07	7	100%
2.5	Project Performance Monitoring	John M	20/07	20/07	7	100%
2.6	Project Closure	John M	20/07	20/07	7	100%

Progress

PROJECT TITLE: PROJECT NUMBER: COMPANY NAME: DATE:

Task Title: Task Owner: Start Date: Due Date: Duration: Pct of Task Complete:

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1.3	Requirements	John M	20/07	20/07	7	100%
1.4	Stakeholders	John M	20/07	20/07	7	100%
1.5	Outcomes	John M	20/07	20/07	7	100%
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2.1	Scope & Goal Setting	John M	20/07	20/07	7	100%
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2.3	Communication Plan	John M	20/07	20/07	7	100%
2.4	Project Launch and Execution	John M	20/07	20/07	7	100%
2.5	Project Performance Monitoring	John M	20/07	20/07	7	100%
2.6	Project Closure	John M	20/07	20/07	7	100%

Cost

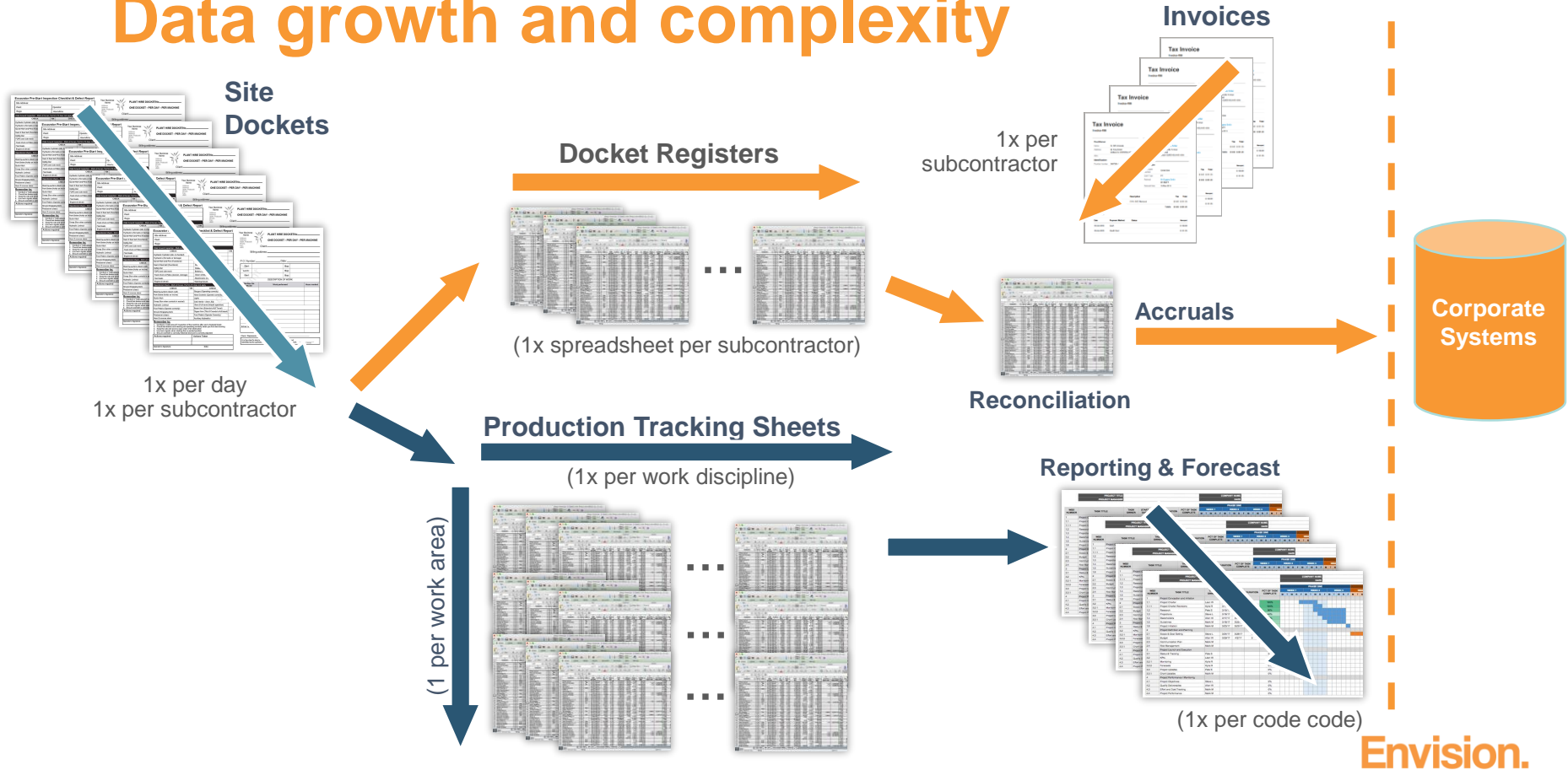


Decision

Action

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Data growth and complexity

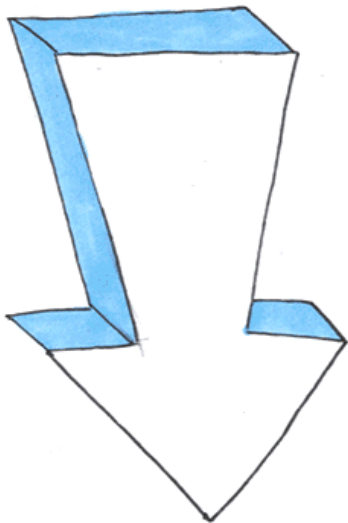




COGNITIVE

BIAS

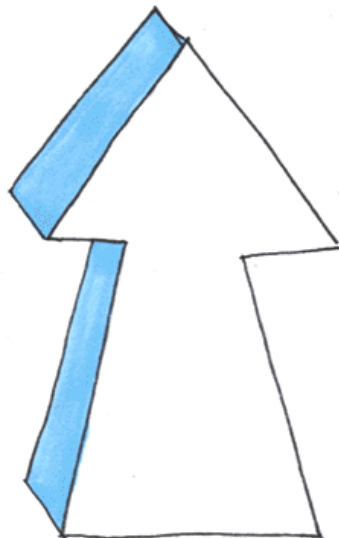
UNDERESTIMATE



how long
projects will
take

+

OVERESTIMATE



how quickly
we can get
things done

=

THE
Planning
FALLACY



“Without data
you’re just
another person
with an opinion.”

- W. Edwards Deming,
Data Scientist

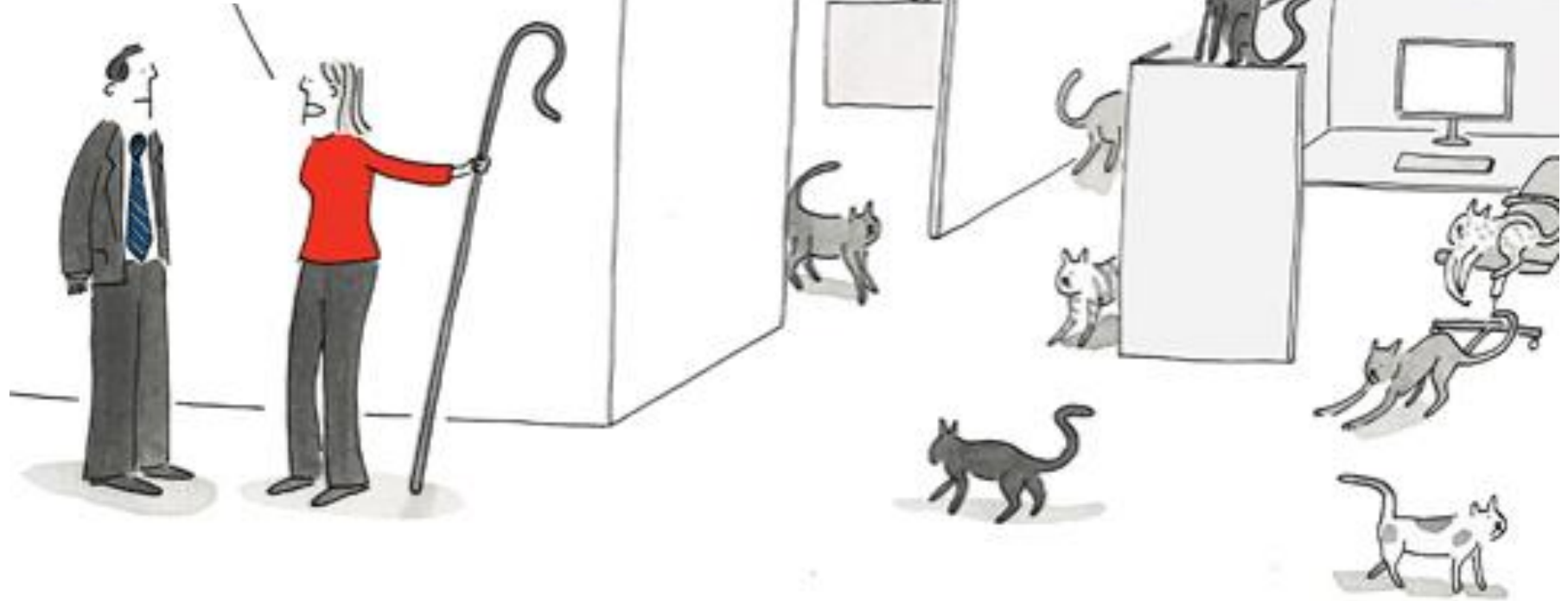


**Data capture is
already happening**

Data Driven Decisions



*I'M JUST COLLECTING THE
SITE PROGRESS
SPREADSHEETS FROM THE
ENGINEERS*



Construction data

- Better projects outcomes require better decisions
- Better decisions require better information (accurate & timely)
- Construction data is an asset – technology unlocks the value

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Construction Data

QMCA Breakfast Briefing

