NODES & LINKS

Making AI Project Controls a reality

2024

Greg Lawton CEO & Co-founder

Here's a bit about me.

GREG LAWTON
CEO & CO-FOUNDER
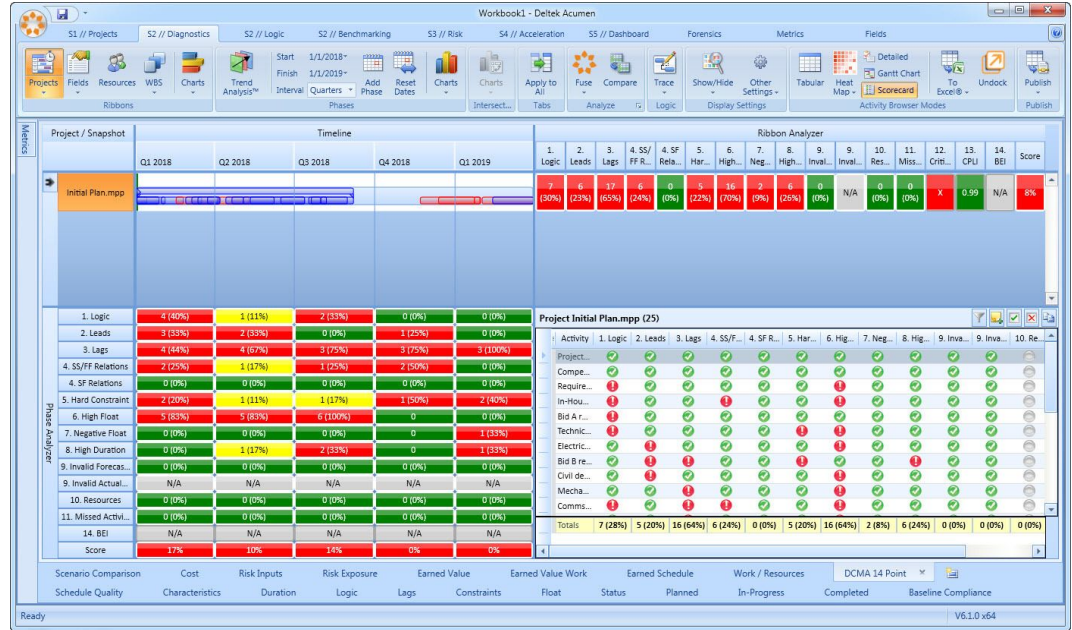NODES & LINKS

AI-Powered
Project Controls

Our Mission

Revolutionise the way project experts create, communicate and consume information on projects

We need to move from this...

...and this...

To this

AI Agent is still in Beta and may make mistakes. Please check important information

What's my project progress?	What changed in this schedule compared to the last one?
Show me the activities that are late in a table	Show me a table with the failing DCMA checks

Ask anything

Please use quotes for Names and Codes.

AI built with published research

Production and Operations Management

POMS

Open access | (cc) (i) | Research article | Firs

The Domino Effect: An Empirical Exposi

Impact Factor: **5.0** / 5-Year Impact Factor:

Home > Journal of Computational Social Science > Article

Mitigation strategies against cascading failures within a project activity network

Journal of Computational Social Science

Journal of Computational Social Science

Aims and scope →

Submit manuscript →

Regular article | Open access | Published: 08 July 2021

Uncovering the fragility of large-scale engineering projects

Marc Santolini ✉, Christos Ellinas ✉ & Christos Nicolaides

EPJ Data Science **10**, Article number: 36 (2021) | Cite this article

3611 Accesses | 5 Citations | 8 Altmetric | Metrics

Submit manuscript →

Home > Applied Network Science > Article

Spreading of performance fluctuations o
real–world project networks

Research | Open access | Published: 22 March 2021

Volume 6, article number 25, (2021) | Cite this article

Download PDF ⬇ | ⚠ You have full access to this open access article

Iacopo Pozzana ✉, Christos Ellinas, Georgios Kalogridis & Konstantinos Sakellariou

👁 **1714** Accesses | 📊 **1** Citation | ⊘ **3** Altmetric | Explore all metrics →

Part of a collection:
Special issue on Epidemics Dynamics & Control on Networks

Article | Open access | Published: 10 January 2023

Activity networks determine project performance

Alexei Vazquez ✉, Iacopo Pozzana, Georgios Kalogridis & Christos Ellinas ✉

Scientific Reports **13**, Article number: 509 (2023) | Cite this article

2506 Accesses | 2 Citations | 8 Altmetric | Metrics

... and our next milestone is to bring **Autonomous AI** to projects

AI/ML Predictions
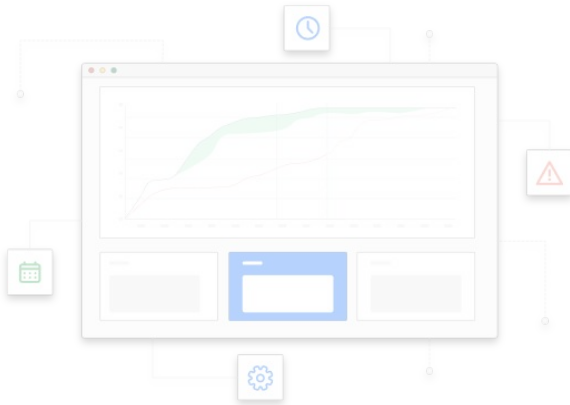
AI Co-planner + Generative Reports

Autonomous AI

WE ARE HERE
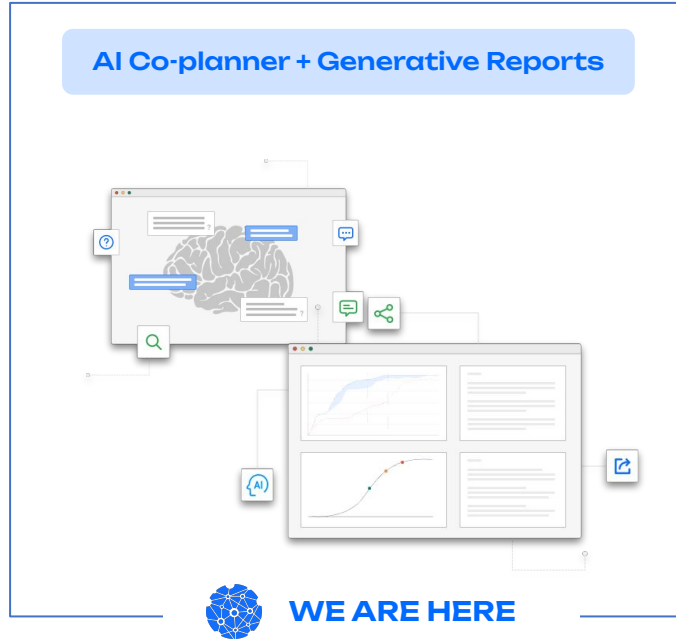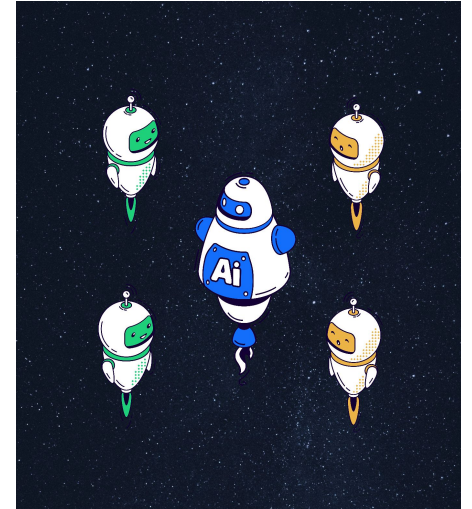
AI/ML Analytics
for Individual Contributors
(planner/risk manager)

Generative reporting
for Information Consumers
(project managers, clients)

Autonomous AI
for Autonomous Work Generation
(all project teams)

We **save time** and make it easy to do **advanced analysis**

Our Goal

17-22 hours a month per person

We take **schedule files** and turn them into **insights**
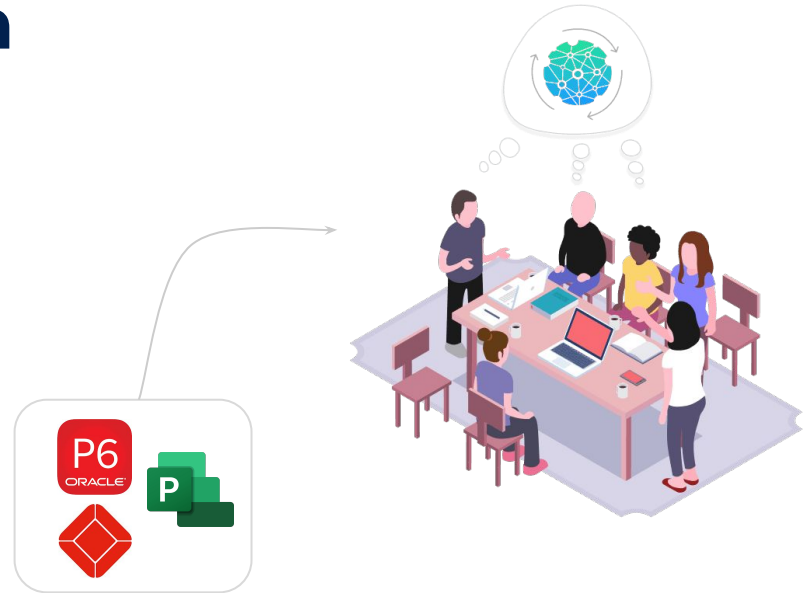
Your Scheduling Co-Planner

INTERACTION

AI Assistant

AI Reporting

ANALYSIS

Health	Comparison
Progress	Delay
Productivity	Risk
Resources	Predictions
Trending	Acceleration
Paths	Carbon
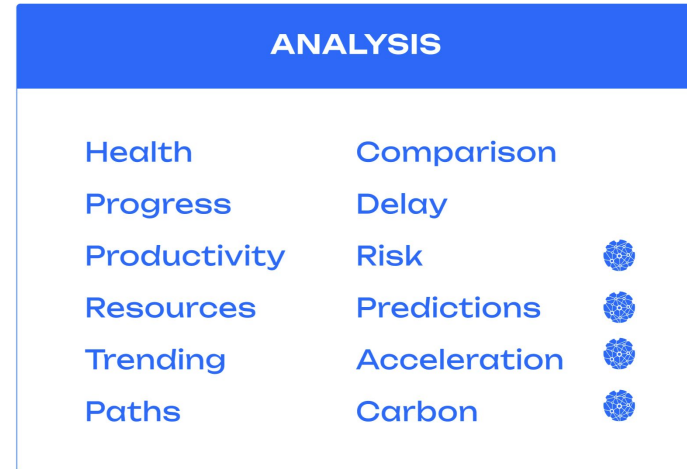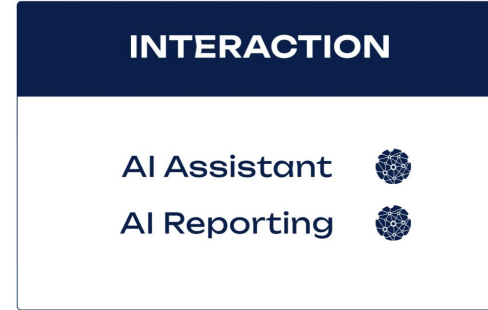
We work with the largest infrastructure projects in the world

BECHTEL
intel
Lilly
DPR CONSTRUCTION
AtkinsRéalis
JFK JOHN F. KENNEDY INTERNATIONAL AIRPORT
mcm

bam nuttall
Rolls-Royce
AECOM
EKFB
ferrovial
Worley

LAING O'ROURKE
CIMIC
NSW GOVERNMENT

MTR

HS2
VANTAGE DATA CENTERS
HILL
gleeds
COSTAIN
Jacobs
Balfour Beatty
VINCI
Laminar
HOCHTIEF INFRASTRUCTURE
D2

Turner & Townsend
DELTA CONSULTING GROUP
EQUINIX
Wates
GallifordTry
GT GARDINER & THEOBALD
Implenia
STRATA
IVICOM CONSULTING
CONSULT

My Goal

Find **one** industry-leading company to bring advanced project AI to the Middle East

Learning Points:

1   **Project Controls Evolution**

2   **What is AI?**

3   **How do we design it for Projects?**

4   **Design Rules**

5   **Examples - QSRA & Reporting**

6   **AI Agency**

You will all be able to get access today

How has
Project Controls
evolved?

Best practice in **Project Controls - 2024**

Defining attribute:
Instant access + weekly reporting
+ greater control options

Leadership

Data Scientist

Controls

Scheduler   Cost Manager   Risk Manager   Change
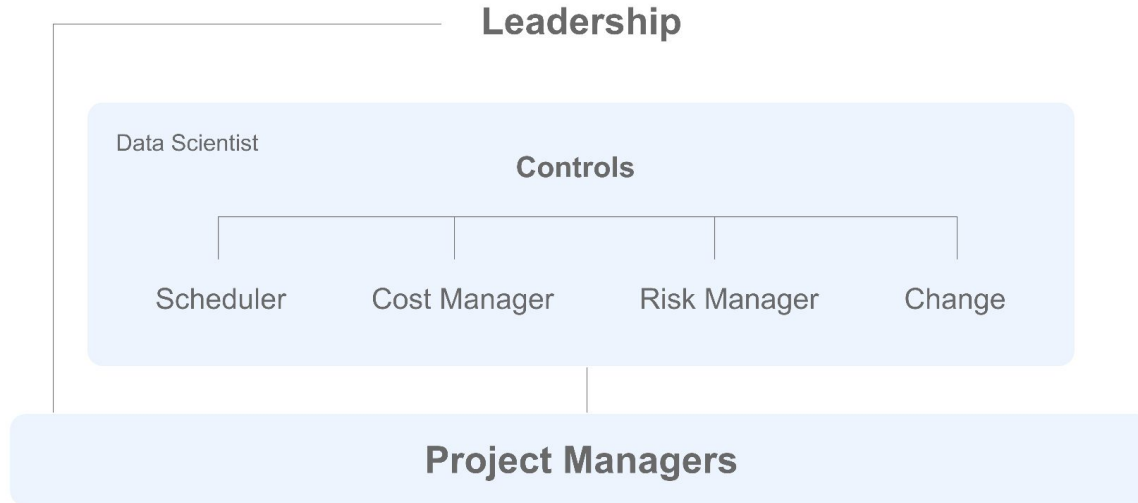
Project Managers

Best practice in **Project Controls - 2030**

Defining attribute:
Daily active control

Leadership

Data Scientist

Controls

Scheduler   Cost Manager   Risk Manager   Change

Project Managers

Are you ready to embrace AI in project management?
blogs.lse.ac.uk • 5 min read
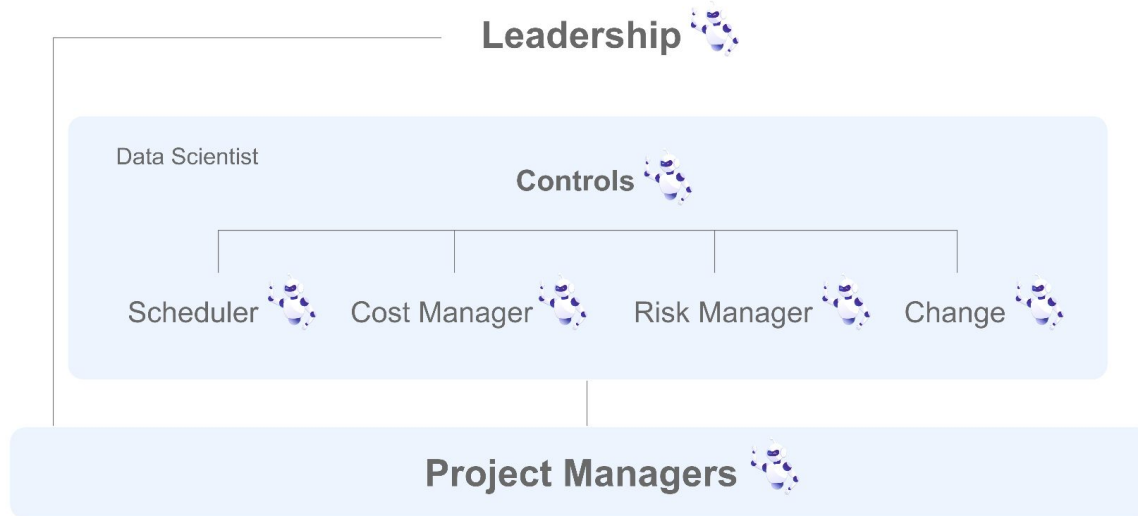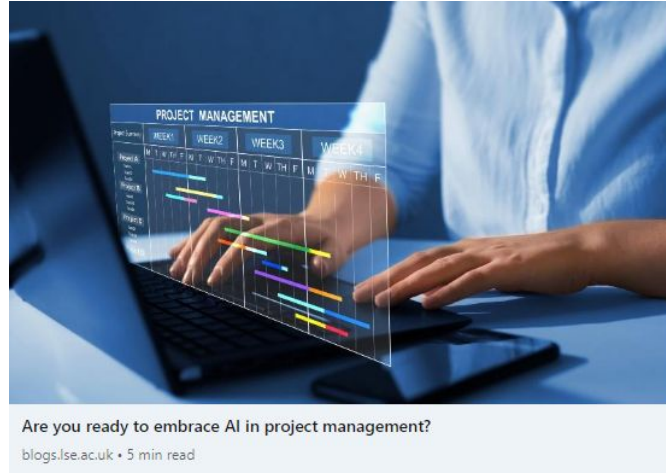
Gartner research suggests that by 2030, 80 per cent of basic project management tasks will be run by AI and powered by big data, machine learning and natural language processing.

We must create the **AI system** that will work for people to deliver the **world's projects**

How are these two **the same?**
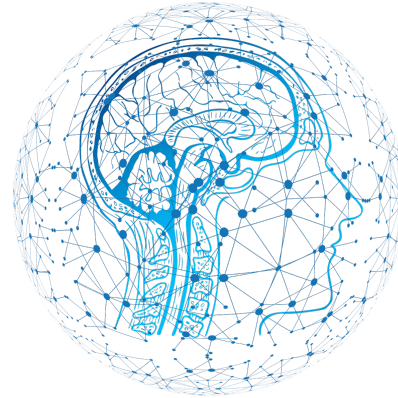
How technology has **evolved**

Edge

Machines automatically built assets for us?

AI

We had machine assistants to answer our questions?

Cloud

We could access and collaborate anywhere?

Internet

We could send and communicate instantly?

Computers

We could calculate instantly, print endlessly and replicate data?

Paper

What if...

We didn't have to remember everything?

Progression of automation
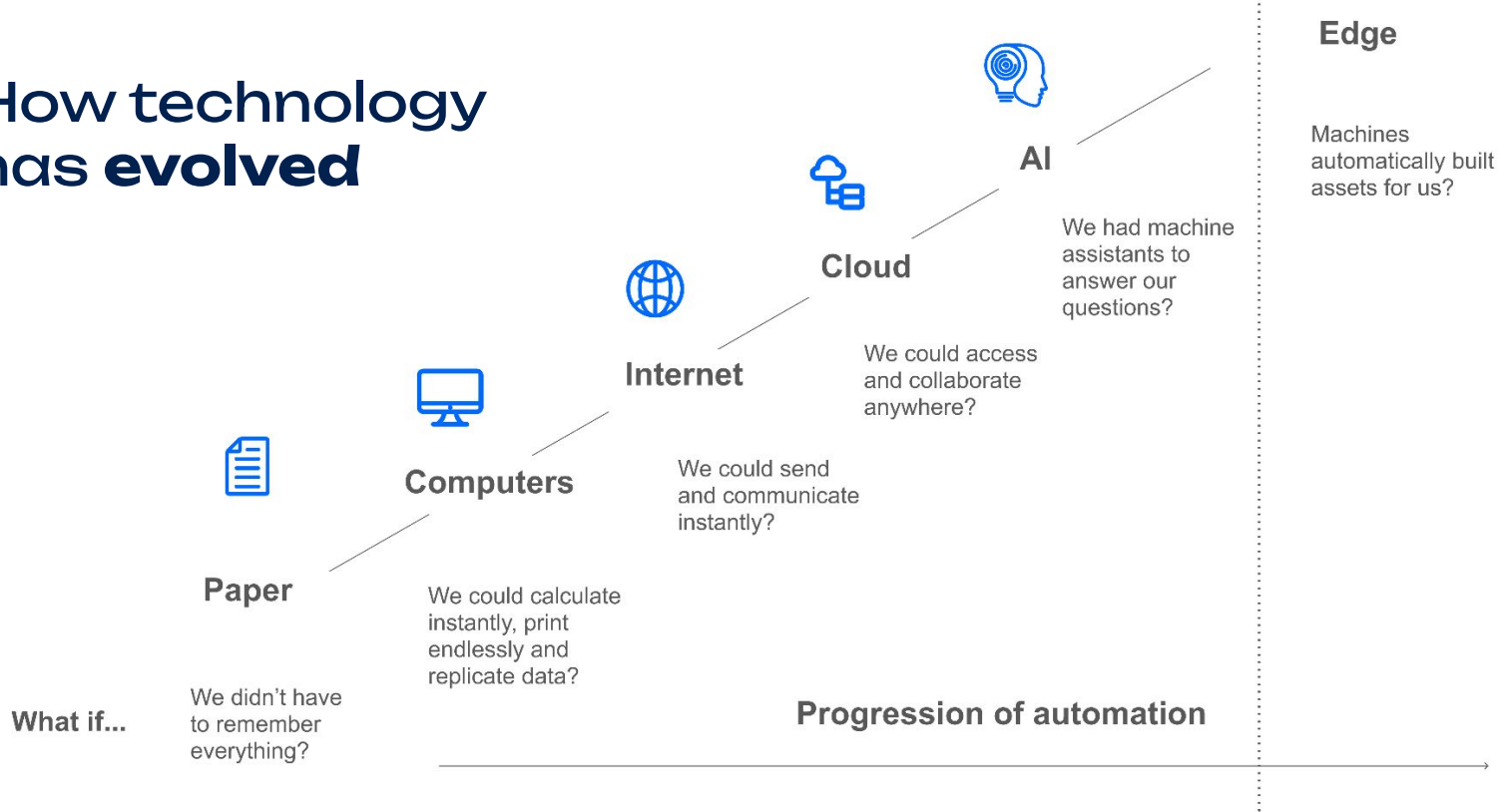
Automation is about scaling the productivity of humanity
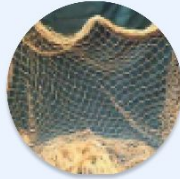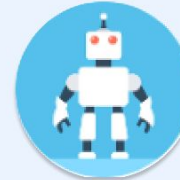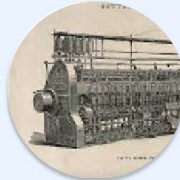
How are these two **the same?**

Same People Better Work

Same People More Work

More People Less Expertise

Less People Same Work

Better unit economics

It's always about **the money**

Project Controls Salary Benchmarks
For Construction, Transport & Infrastructure

🇬🇧 UK | 🇦🇺 AUS

£30-40,000 Assistant Planner	$70-120,000 Scheduler
£40-50,000 Planner	$130-160,000 Planner
£45-55,000 Programme Planner	$160-190,000 Senior Planner
£55-65,000 Senior Planner	$180-200,000 Lead Planner / Master Planner

Project Controls Salary Benchmarks
For Construction, Transport & Infrastructure

🇬🇧 UK | 🇦🇺 AUS

£60-75,000 Lead Planner	$250-350,000 Planning Director / Head of Planning
£75-95,000 Planning Manager	$300-450,000 Programme Director
£100-125,000 Head of Planning	
£120-150,000 Director of Project Controls	Data from the Plan Rich Podcast

22 hours of work

System Cost

$2,750

$500

How do we think about AI design?

Planning Hierarchy

Job Title	Trainee / Graduate Planner TP/GP	Assistant Planner AP	Planner PL	Senior Planner SP	Planning Manager PM	Sr Planning Manager SPM	Head of Planning PD
Level	1	2	3	4	5	6	7
Role Type	Individual Contributor IC	Individual Contributor IC	Individual contributor IC	People leader/Area leader PL	People leader/Area leader Leader of Managers/Specialist PL/LM	Leader of Managers/Specialist LM	Business leader/Expert BL
Skills	Development	Development	Technical	Managerial	Managerial	Strategic	Strategic
	Understand	Understand	Demonstrate	Guide	Coach	Lead	Lead
Level of Responsbility	At this level you have an **understanding and awareness** of a wide range of expertise that is applied effectively	At this level you have an **understanding and awareness** of a wide range of expertise that is applied effectively	At this level your **accomplishments are reached** through a range of projects that clearly demonstrate your skills and experience	At this level your considerable experience and knowledge is illustrated through achievements in a range of operational or technical projects. On a daily basis you will guide other to reach their goals	At this level, you practically initiate and oversee critical operational or technical projects. You are regularly required to coach and develop others to successfully achieve individual or team goals	At this level your leadership influences and shapes a framework of projects for today and the future. As a mentor you provide depth to the organisation through your experience	At this level your leadership influences and shapes the organisation for today and the future. As a mentor you provide depth to the organisation through your experience
Scale of functional/technical experience	None	None	At least one project end-to-end; at least one technical specialism, focus area	Managing multiple smaller projects; or at least one major project; single technical disciplines	As level 4, but in different key roles or in different industries; complex infrastructure or technology	As level 5 with international experience, industry leadership; major programme management; business unit Directors	As Level 6 plus external stakeholders
Level of responsibility	None	None	Able to complete structured and defined tasks. Able to work as part of a team as required.	Some form of technical or team leadership; project management of a defined sub task involving engagement with others.	Responsible for discrete projects, technical deliverables and or a defined part of a business including line management;	Key influencer for delivery to time & budget of multiple projects, or large projects; Responsible for teams typically	Responsible for the delivery to time & budget of major projects; management of teams	As level 6 plus manage function
Depth of industry knowledge & experience	None	None	Basic Awareness of industry and function	General awareness; capability in one technical/function.	Excellent specific knowledge in primary technical/function.	Broad knowledge across relevant technical/functions areas; conference presentations; published works; recognised technical/functional leader	Deep knowledge of standards & regulations; industry expert or adviser; broad knowledge of railways; engineering; infrastructure
Indicative experience required for grade (this table is not part of the capability assessment)	None	None	No experience; Apprentice; Student Placement	More than 1 year, or other pre-experience from training, university	More than 5 years	More than 10 years	More than 20 years, with 10 at a senior level
Professional Development; Qualifications;	None	None	Relevant professional or vocational training completed.	As level 3, plus professional institution membership	As level 4.	As level 5, plus working towards additional level of professional recognition (e.g. Fellow of ICE) or qualification in management.	As level 6. Also including industry leadership; business management; consultancy/advisory roles

Planning Hierarchy

Job Title	Trainee / Graduate Planner TP/GP	Assistant Planner AP	Planner PL	Senior Planner SP	Planning Manager PM	Sr Planning Manager SPM	Head of Planning PD
Level	1	2	3	4	5	6	7
Role Type	Individual Contributor IC	Individual Contributor IC	Individual contributor IC	People leader/Area leader PL	People leader/Area leader Leader of Managers/Specialist PL/LM	Leader of Managers/Specialist LM	Business leader/Expert BL

Skills

| Development | | Technical | Managerial | Strategic |

Level of Responsibility

Understand	Demonstrate	Guide	Coach	Lead
At this level you have an **understanding and awareness** of a wide range of expertise that is applied effectively	At this level your **accomplishments are reached** through a range of projects that clearly demonstrate your skills and experience	At this level your considerable experience and knowledge is illustrated through achievements in a range of operational or technical projects. On a daily basis you will guide other to reach their goals	At this level, you practically initiate and oversee critical operational or technical projects. You are regularly required to coach and develop others to successfully achieve individual or team goals	At this level your leadership influences and shapes a framework of projects for today and the future. As a mentor you provide depth to the organisation through your experience	At this level your leadership influences and shapes the organisation for today and the future. As a mentor you provide depth to the organisation through your experience

Responsibilities are delivered via workflows

Workflows consist of tasks

Tasks can be automated

Our Rules

Secure data

**Secure
data**

**Data
ownership**

Secure data

Data ownership

Private models

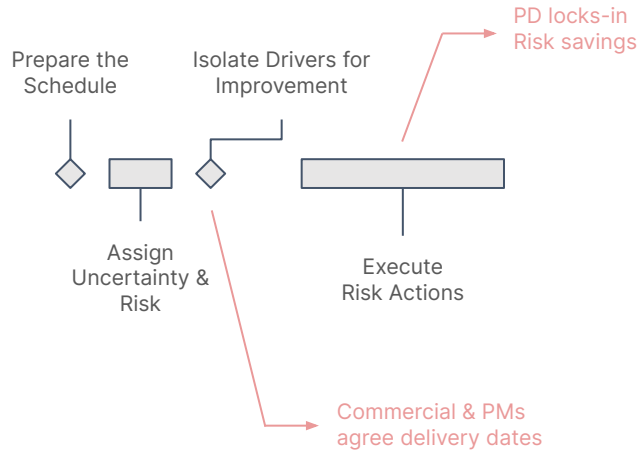**Secure data**

Data ownership

Private models

Task, not workflow

Give me examples
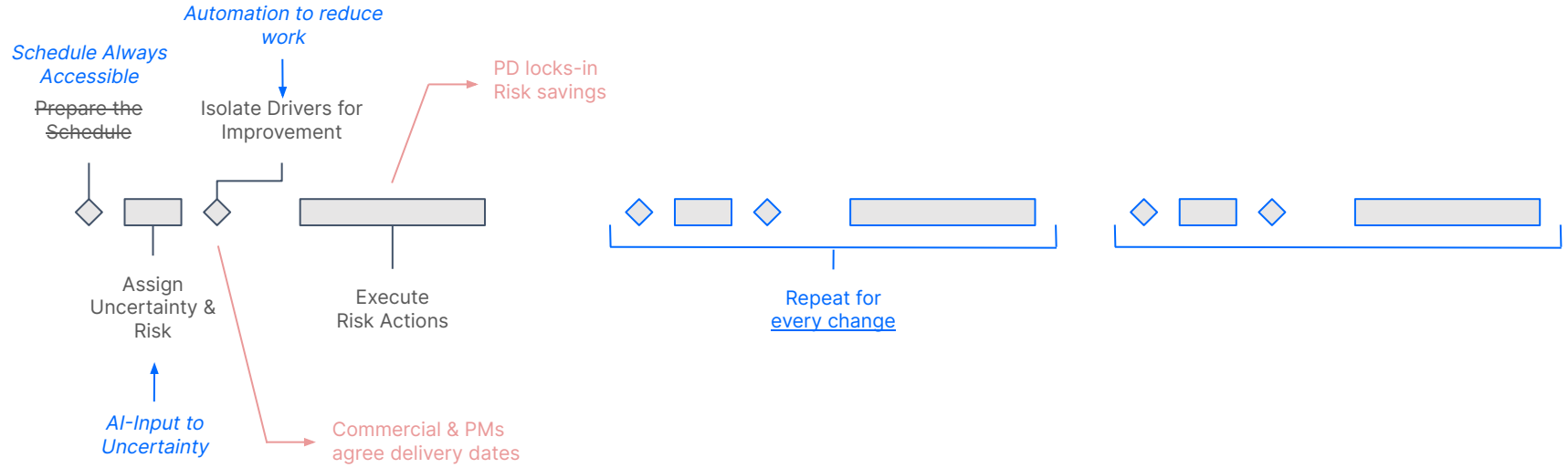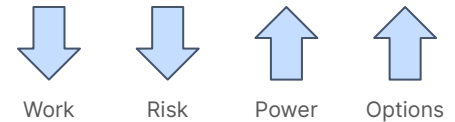
The **QSRA Process Flow**

Prepare the
Schedule

Isolate Drivers for
Improvement

PD locks-in
Risk savings

Assign
Uncertainty &
Risk

Execute
Risk Actions

Commercial & PMs
agree delivery dates

Repeat in
12 months

The **QSRA Process Flow**

Schedule Always Accessible

Automation to reduce work

~~Prepare the Schedule~~

Isolate Drivers for Improvement

PD locks-in Risk savings

Assign Uncertainty & Risk

Execute Risk Actions

AI-Input to Uncertainty

Commercial & PMs agree delivery dates

Repeat for every change

The **QSRA Process Flow**

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Execute Risk Actions

AI-Input to Uncertainty

Commercial & PMs agree delivery dates

Repeat for <u>every change</u>

Work   Risk   Power   Options

Rail Project › V13 with Baselin...
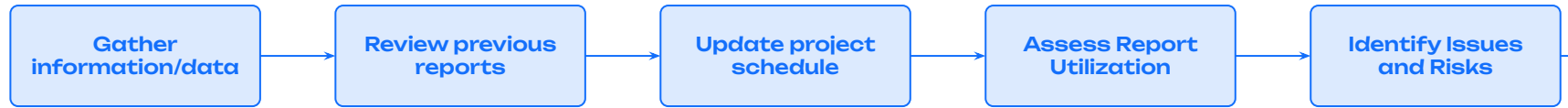
Risk ?

| Duration Uncertainty | Risk Events | Templates | | Risk Drivers |

Changes have been made, please rerun to generate your revised results

Gantt | No Links | Distribution | Result

Description	Start Date	Finish Date	Duration (d)	TF (d)	Status	Inherit	AI	Template	Min	Prob	Max
G.G.1334: Prepare/Isst	05 Dec 2016	09 Dec 2016	4			☐					
G.G.8043: Prepare/Isst	09 Jan 2017	25 Jan 2017	12			☐					
G.G.8083: Prepare/Isst	06 Feb 2017	22 Feb 2017	12			☐					
G.G.1300: Prepare/Isst	20 Feb 2017	23 Feb 2017	3			☐					
G.G.1216: Prepare/Isst	27 Feb 2017	29 Mar 2017	22			☐					
G.G.1350: Prepare/Isst	27 Feb 2017	31 Mar 2017	24			☐					
G.G.1214: Prepare/Isst	01 Mar 2017	06 Mar 2017	3			☐					
G.G.1342: Prepare/Isst	02 May 2017	08 May 2017	5	-38					4.25	5	5.75
G.G.1218: Prepare/Isst	19 May 2017	25 May 2017	5	-34		☑			4	5	8
G.G.1326: Prepare/Isst	25 May 2017	01 Jun 2017	5	-43		☐			5	5	5.75
G.G.1212: Prepare/Isst	31 May 2017	13 Jun 2017	10	-17		☑			8	11	16
G.G.8063: Prepare/Isst	31 May 2017	06 Jun 2017	5	209		☐			4.25	5	5.75
G.G.1358: Prepare/Isst	14 Jun 2017	27 Jun 2017	10	-18		☑			8	11	16
G.G.1370: Prepare/Isst	21 Jun 2017	18 Jul 2017	20	-10		☐			16	22	31
G.G.1338: Prepare/Isst	13 Jul 2017	26 Jul 2017	10	10		☑			8	11	16
G.G.1280: Prepare/Isst	19 Jul 2017	25 Jul 2017	5	-45		☑			4	5	8
G.G.1292: Prepare/Isst	20 Jul 2017	16 Aug 2017	20	35		☐			17	35	35
G.G.1262: Prepare/Isst	24 Jul 2017	18 Aug 2017	20	-65		☑			16	22	31
G.G.1362: Prepare/Isst	17 Aug 2017	14 Sep 2017	20	35		☑			16	22	31
G.G.1382: Prepare/Isst	05 Sep 2017	11 Sep 2017	5	32		☑			4	5	8
G.G.1386: Prepare/Isst	05 Sep 2017	11 Sep 2017	5	27		☑			4	5	8
G.G.1390: Prepare/Isst	05 Sep 2017	11 Sep 2017	5	27		☑			4	5	8
G.G.1296: Prepare/Isst	05 Sep 2017	02 Oct 2017	20	58		☐			16	22	31
G.G.1310: Prepare/Isst	14 Sep 2017	04 Oct 2017	15	12		☐			9	12	15
G.G.1378: Prepare/Isst	09 Nov 2017	06 Dec 2017	20	55		☐			20		20
1: Project Management	17 May 2016	30 May 2017	379			☑					

Navigation menu:
Home
INSIGHTS
Progress
Delay Analysis NEW
Resources
Schedule
  Paths
  Activities
  Risk
  Risk Drivers
  Risk Register NEW
AI Prediction
CO₂ Mgmt
Visualise
Compare
Health
Invite to Project

Probability chart with values 16, 20, 22, 31 marked.

Status Update Reports

Gather information/data	Review previous reports	Update project schedule	Assess Report Utilization	Identify Issues and Risks

Manual Work

Gather information/data
- Review project documentation.
- Consult team members and stakeholders.
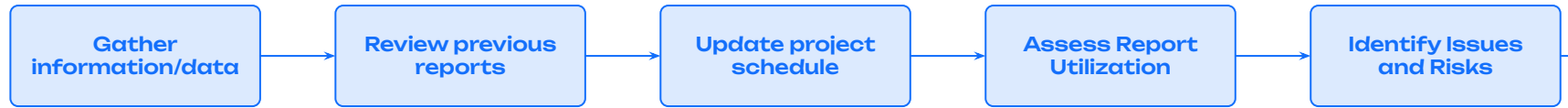- Collect progress updates from team leads or individuals.

Review previous reports
- Analyze previous status reports for unresolved issues.
- Examine historical project data.
- Identify trends or patterns in project performance.

Update project schedule
- Review completed tasks and milestones.
- Adjust task durations based on actual progress.
- Update dependencies and critical paths.

Assess Report Utilization
- Evaluate resource allocation against the project plan.
- Analyze resource availability for upcoming tasks.
- Review budgetary allocations and expenditures.

Identify Issues and Risks
- Identify and document any new issues or risks.
- Assess the impact and likelihood of each risk.
- Propose mitigation strategies for high-priority risks.

Status Update Reports

| Gather information/data | | Review previous reports | | Update project schedule | | Assess Report Utilization | | Identify Issues and Risks |

Manual Work

- Review project documentation.

- Consult team members and stakeholders.

- Collect progress updates from team leads or individuals.

- Adjust task durations based on actual progress.

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- Assess the impact and likelihood of each risk.

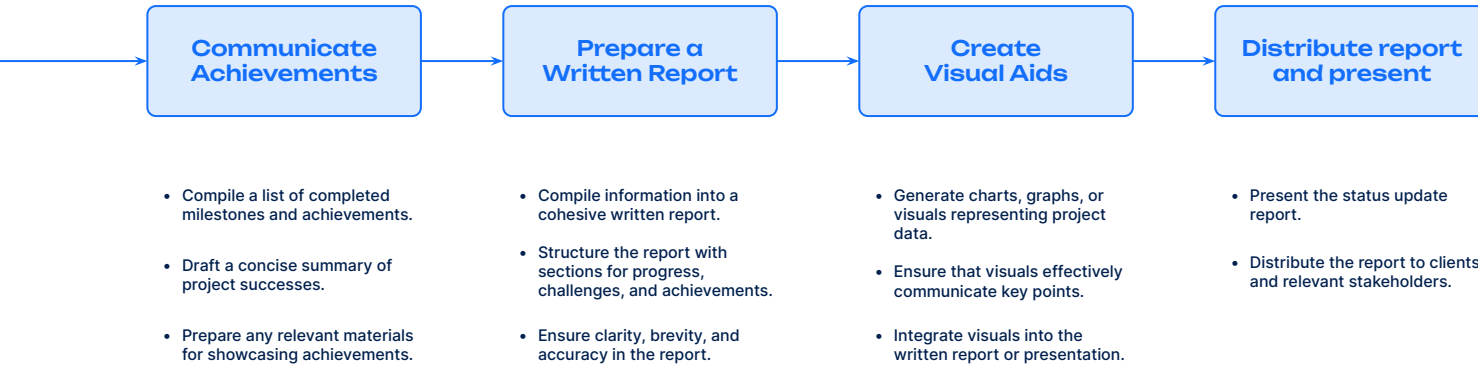- Propose mitigation strategies for high-priority risks.

AI does it for you

- Analyze previous status reports for unresolved issues.

- Examine historical project data.

- Identify trends or patterns in project performance.

- Review completed tasks and milestones.

- Update dependencies and critical paths.

- Evaluate resource allocation against the project plan.

- Review budgetary allocations and expenditures.

- Assess the impact and likelihood of each risk.

- Propose mitigation strategies for high-priority risks.

Communicate Achievements

- Compile a list of completed milestones and achievements.
- Draft a concise summary of project successes.
- Prepare any relevant materials for showcasing achievements.

Prepare a Written Report

- Compile information into a cohesive written report.
- Structure the report with sections for progress, challenges, and achievements.
- Ensure clarity, brevity, and accuracy in the report.

Create Visual Aids

- Generate charts, graphs, or visuals representing project data.
- Ensure that visuals effectively communicate key points.
- Integrate visuals into the written report or presentation.

Distribute report and present

- Present the status update report.
- Distribute the report to clients and relevant stakeholders.

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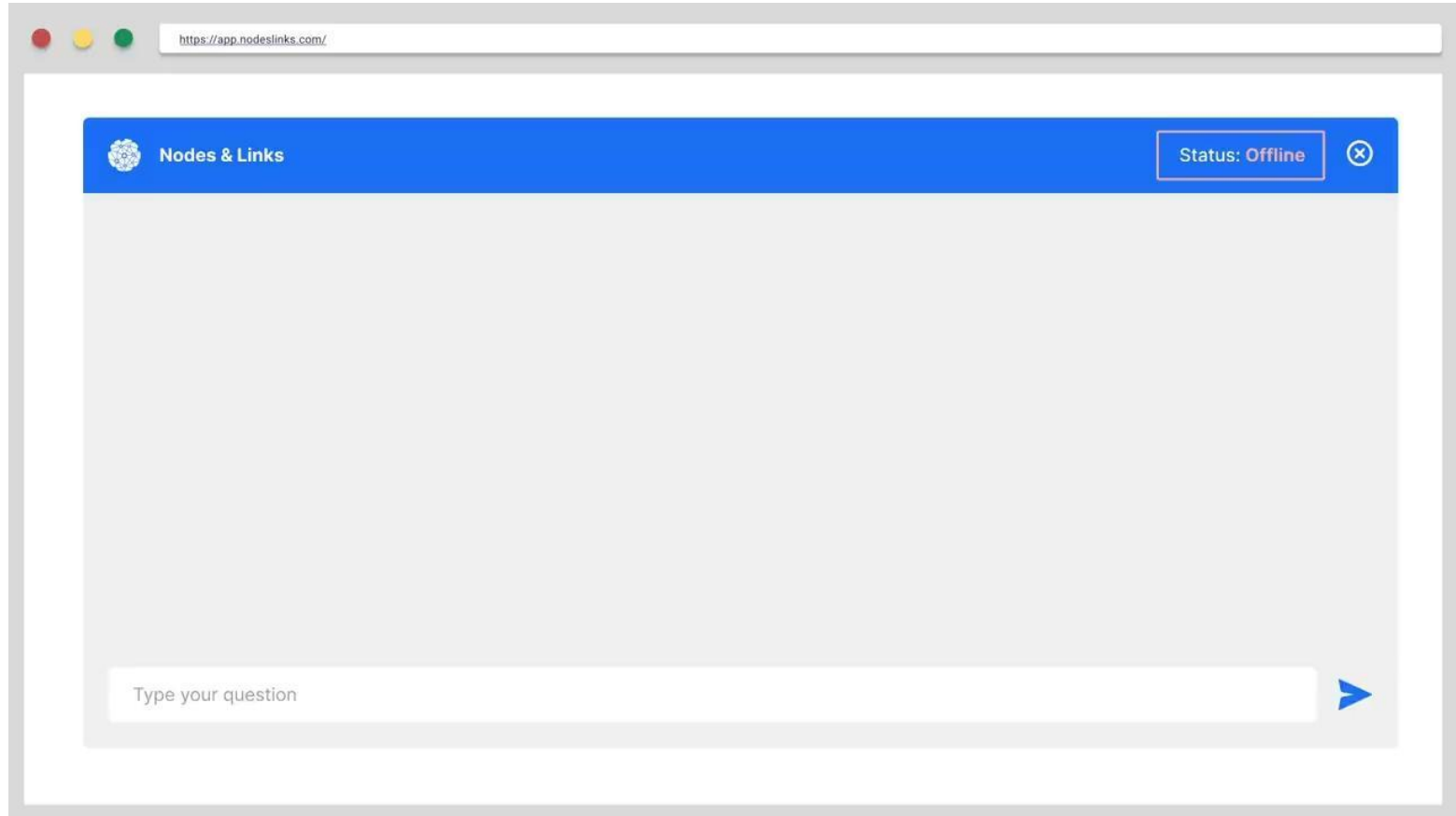- Distribute the report to clients and relevant stakeholders.

What if we took it one step further?

What if we added an AI agent to your project team?

The AI workforce has become a reality at Nodes & Links.

https://app.nodeslinks.com/

Nodes & Links

Status: Offline

Type your question

Introducing Agent.

Agent Beta launching next week.

What's my project progress?

What changed in this schedule compared to the last one?

Show me the activities that are late in a table

Show me a table with the failing DCMA checks

Ask anything

Please use quotes for Names and Codes.

Join Agent's beta

and be a part of the industry's future.

We help consultants **win more business.**

Turner & Townsend was able to use the speed of the analysis to enable planners to brainstorm mitigation strategies and new methods to accelerate their schedule. Combined with the advanced analytics, changes made in those scenarios were immediately assessed and acted on without having to wait weeks for the analysis results.

232 hours saved monthly

6x efficiency

40x faster

327% ROI

232 hours saved monthly

6x efficiency

40x faster

327% ROI

In previous implementations at Turner & Townsend, Nodes & Links has saved 232 monthly hours, increased efficiency by 6x, analyzed schedules 40 times faster, and given the client a 327% ROI. By being able to identify these critical changes efficiently it enabled planners to have more time to work with the client and the contractor on mitigating these challenges to enhance project outcomes.

Turner & Townsend was able to use the speed of the analysis to enable planners to brainstorm mitigation strategies and new methods to accelerate their schedule. Combined with the advanced analytics, changes made in those scenarios were immediately assessed and acted on without having to wait weeks for the analysis results.

KATE BURBIDGE
DIRECTOR
TURNER & TOWNSEND

We help contractors cut costs.

" Nodes & Links enabled us to **extract more value** out of our project data. We were able to **get ahead of risk & gather actionable insights** from our existing project data, thus **saving both time and money.** "

COSTAIN

210 hours saved monthly

8x more insights

11x faster

62% ROI

COSTAIN

210 hours saved monthly

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"

Nodes & Links enabled us to **extract more value** out of our project data. We were able to **get ahead of risk & gather actionable insights** from our existing project data, thus **saving both time and money.**

LEIGH WAKEFIELD
CIVIL AND NUCLEAR DIRECTOR
COSTAIN

We give owners
certainty.

intel®

$5bn
Budget for just this project

AI won't replace you, schedulers using AI will.
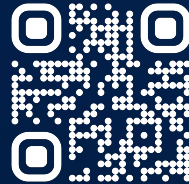
AI won't replace your business, businesses using AI will.

Learn more about **Nodes & Links AI** for project controls

Create a free account

Test our platform **for free** with preloaded demo data.

Book a free demo

We'll walk you through the platform and show you **how our features work.**

Visit **nodeslinks.com**

NODES & LINKS

Making AI Project Controls a reality

2024

Greg Lawton CEO & Co-founder

You can reach out to me directly.

AI for Project Controls

greg@nodeslinks.com