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Connection Journeys AI

Understanding the Opportunity for AI within the HV and EHV Journeys

December 2025

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Welcome

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Agenda I

Project Panel I Panel members today include representatives from National Grid, Baringa and EA Technology

Rois Smith

National Grid

Innovation and Deployment Engineer

Ravish Sareen

Baringa

Senior Manager, Strategy & Transformation

Ben Smith

Baringa

Director, AI & Solutions

Jack Irvine

Baringa

Manager, AI & Solutions

Thomas Stone

EA Technology

Consultant

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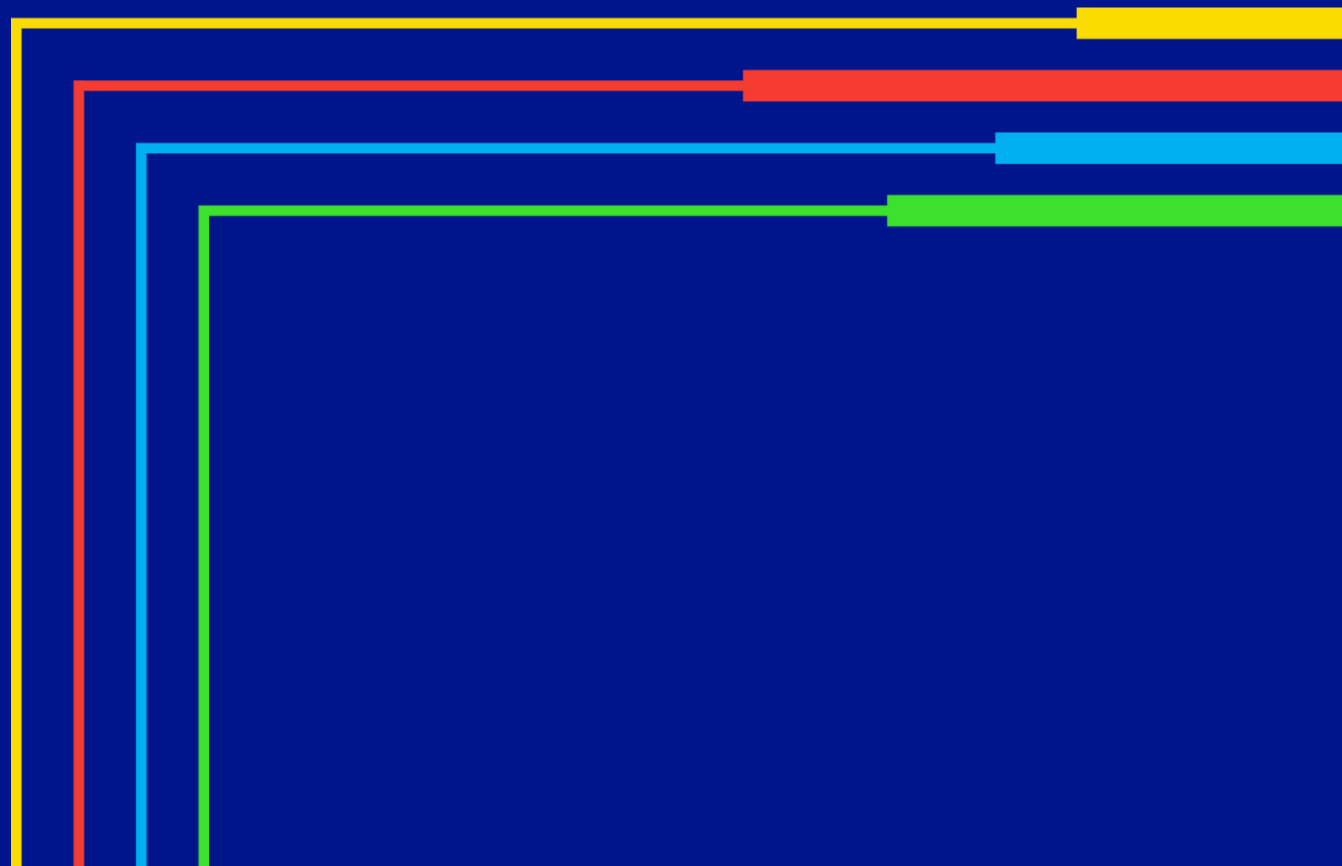
Introduction



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ENA Basecamp |

Connection Hackathon I

>70 ideas were refined and developed into 5 prototype solutions including AI…

Stakeholders asked…

PowerPlan.AI

Solution

Pre-application AI tool to determine reinforcement needs and to generate alternative options for connections

Benefits

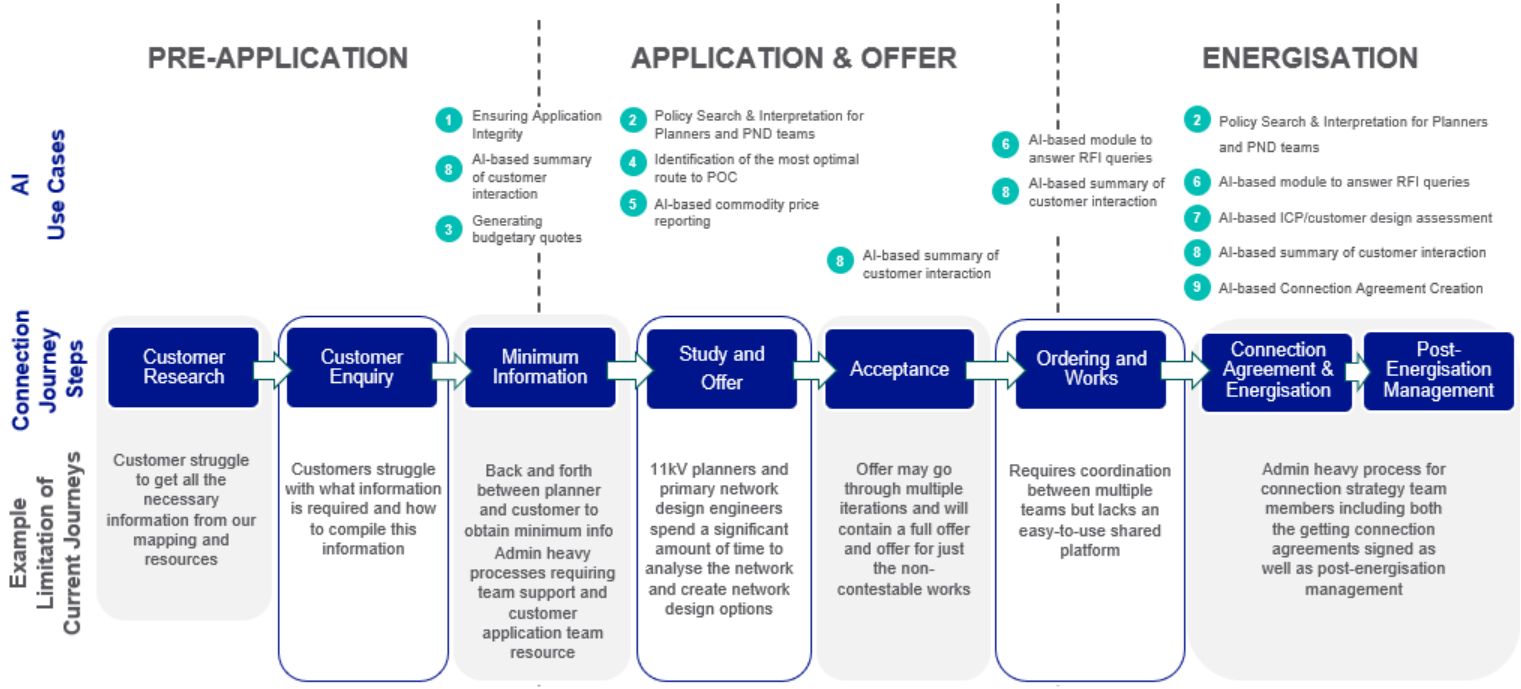
- Improved quality of connections
- Better utilisation of capacity
- Speeds up connections process
- Consumer costs reduced

Risks

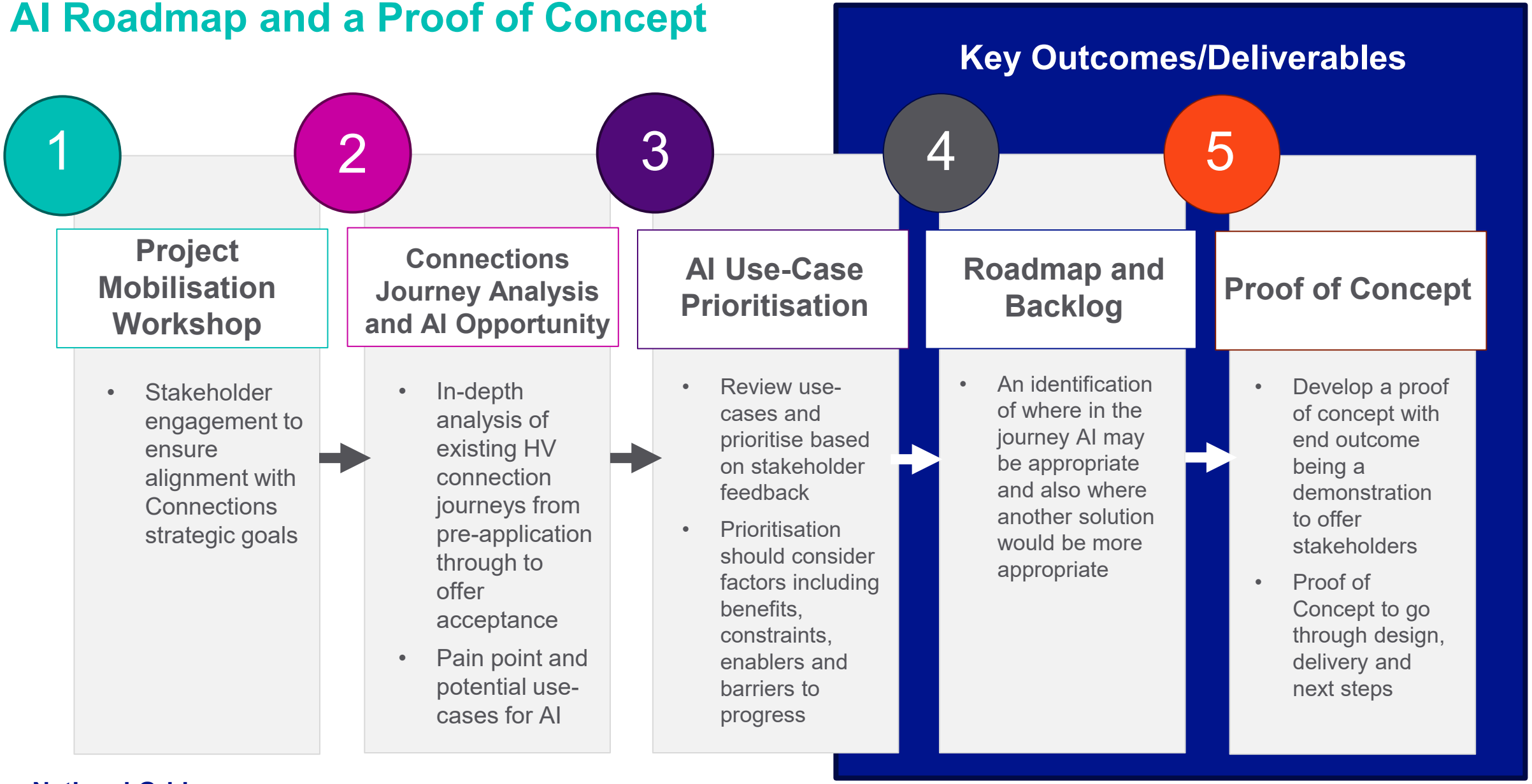
- Data quality
- Data sources e.g. NESO/NGET
- Complexity of interactivity
- Consistency of approach

We're delivering this and beyond…

AI Opportunities across the E2E Connection Journeys



Project Detail I Through stakeholder engagement the project will develop an AI Roadmap and a Proof of Concept



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AI Use Cases

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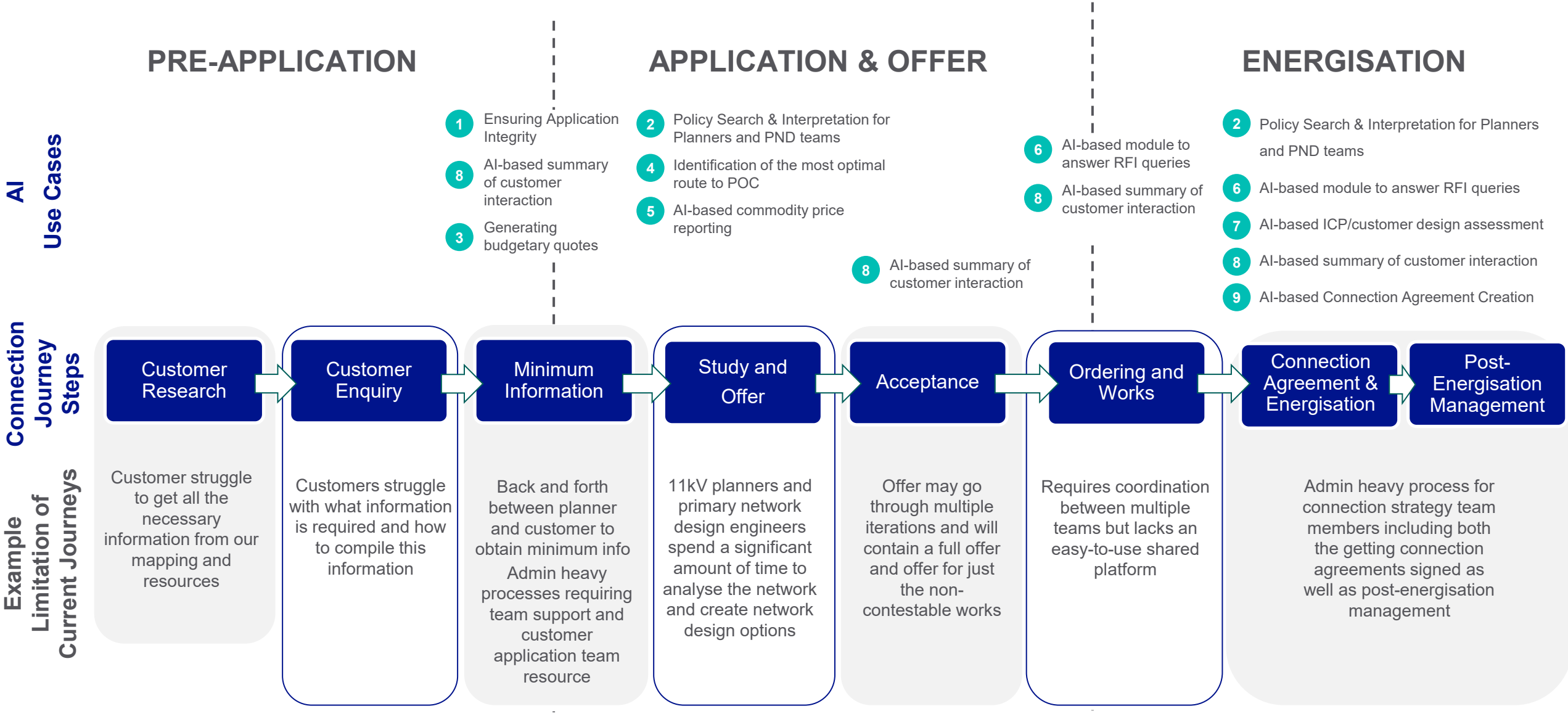
From Pain Points to Actionable Use Cases

~70 Pain Points were discussed during 3 Deep Dive workshops across e-2-e connections journey

Each solution was identified as a Digital, Data, Process, AI solutions

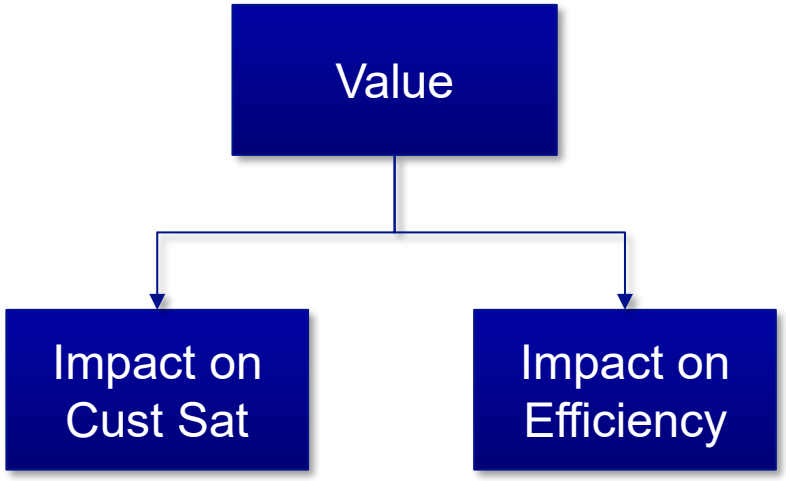
A thorough evaluation process resulted in 9 feasible AI use cases impacting multiple steps along the end-to-end connections journey.

AI Opportunities across the E2E Connection Journeys



Proposed Ranking Framework for Guidance

This slide introduces the proposed ranking framework for evaluating AI initiatives based on their impact on efficiency and customer satisfaction. The framework categorises the impact into three levels: high, medium, and low, providing a structured approach to assess the potential benefits of each initiative. The stakeholders used this criterion to rank the solutions that offer the most significant improvements in both operational efficiency and customer experience.



Impact on Customer Satisfaction	Impact on Efficiency
High – Has a significant shift in customer sentiment. i.e. significant improvement in transparency of info and delivers agility in response from NGED	**High** - Implementing an automation system that reduces processing significantly.
Medium – Leads to some noticeable improvement in customer satisfaction. i.e. moderate improvement in transparency of info and delivers agility in response from NGED	**Medium** - The initiative leads to a measurable but moderate increase in efficiency.
Low – Has minimal or no improvement in transparency of info or in agility in response from NGED	**Low** - The initiative yields little or no immediate improvement in efficiency metrics. It may have a negligible effect or only enable future improvements indirectly

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Budget Estimate and Quotation Development

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AI Use Case 3: ML based budgetary quotation

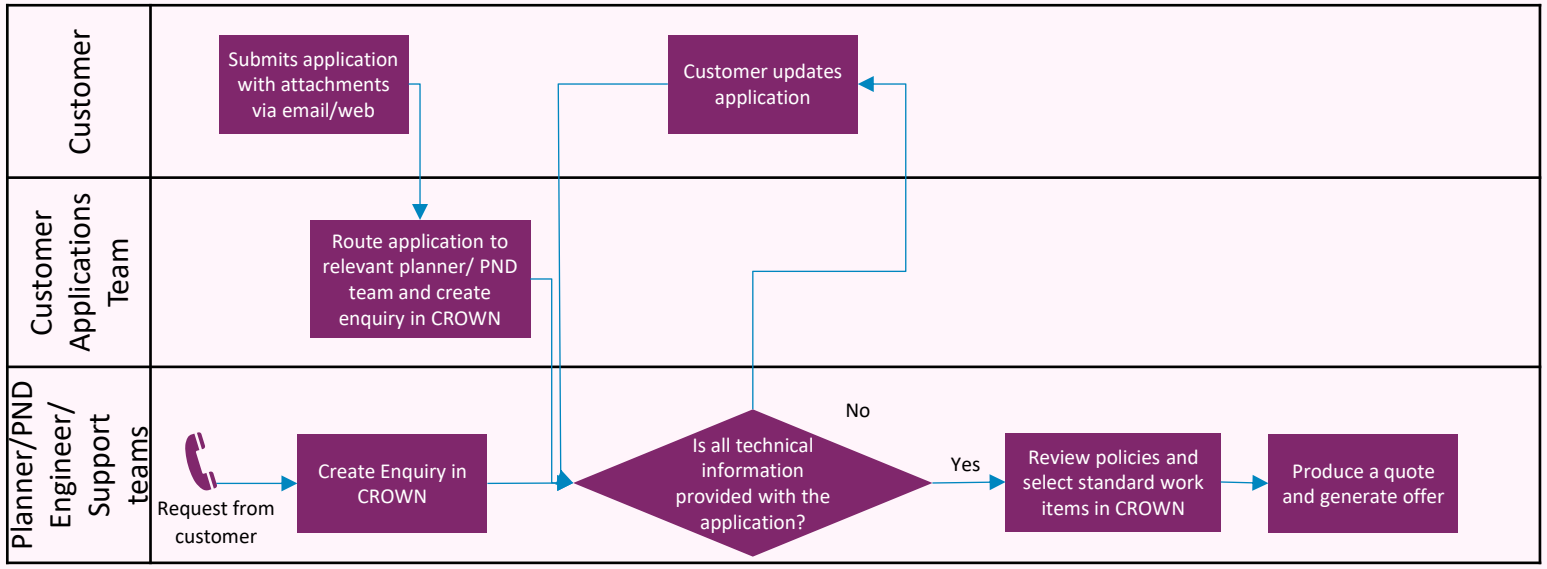
Summary of the issue

- At present, users are unable to generate budget quotations via self-service. Numerous requests for budget quotes have been submitted by applicants, increasing the workload for designers and diverting their attention from more critical and complex formal offers.
- Over the past five years, more than 9,500 applications were received for budgetary quotes at 11 kV or below, while approximately 3,500 applications were submitted for connections at 33 kV and above. Not all budgetary quotes convert into valid connection projects. While planners and PND engineers create high-level budgetary quotes without conducting detailed studies, the volume of budgetary quotes creates a significant demand on planners/PND teams' time.
- Several customers have reported a significant difference between budgetary and formal quotes and expressed dissatisfaction.

Stakeholders who are impacted

Planners and PND Engineers

Current Process



AI-based solution Digital Solution Manual process

Connections Journey and Process Steps

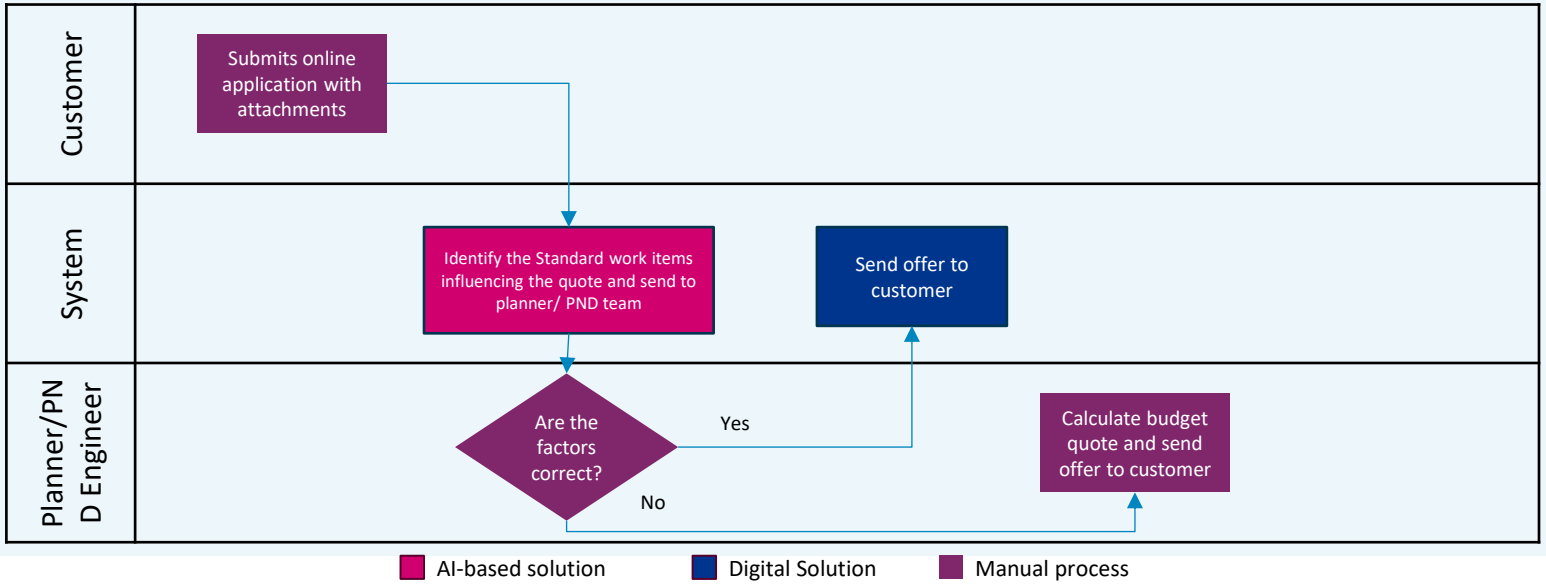
- Application to Offer: Budgetary quotation and Formal quotation

AI Use Case 3: ML based budgetary quotation

High level overview of the solution

- A machine learning approach that will empirically derive the budget prediction and/or the inputting factors leveraging regression and classification techniques, respectively. This model will leverage all available data input into an application, serving as the independent variables, including temporal features that can learn seasonal and other time-dependent variations.
- The dependent variable could leverage final offers for applications and budgetary factors. The solution will involve an analysis of correlations between the dependent and independent variables, which will identify salient features which, via feature engineering, will be curated into a training and test dataset. Competitive testing of various machine learning models will be leveraged, with additional consideration for explainability, to provide NGED with insight into which features most impact the output. A planner or PND engineer can review the budgetary quotes and input factors until they build enough trust and then be exposed to customers through a web portal or other customer-facing interfaces.

High level process flow with the solution



Impact on NGED Commitments within ED2

High	Medium	Low

- **GM1: Customer Satisfaction**
- **GM2: Awareness of Competition**
- **GM3: Guaranteed Standards of Performance**
- **GM4: Stakeholder Engagement**
- **GM5: Published Information**
- **GM6: MCTTQ/MCTTC**

Impact Description

- This approach aims to bridge the gap between the quotes produced at the budget stage and the formal offer stage and will enhance customer satisfaction. (GM1)
- Implementing digital and AI tools to generate speculative budget quotes will increase the efficiency of planners and PND teams, allowing them to concentrate on more complex and time-intensive tasks. (GM1, GM6)
- This efficiency and bandwidth will help in improving GSOP performance and improving the MCTTQ metrics. (GM3 and GM6)

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Next Steps

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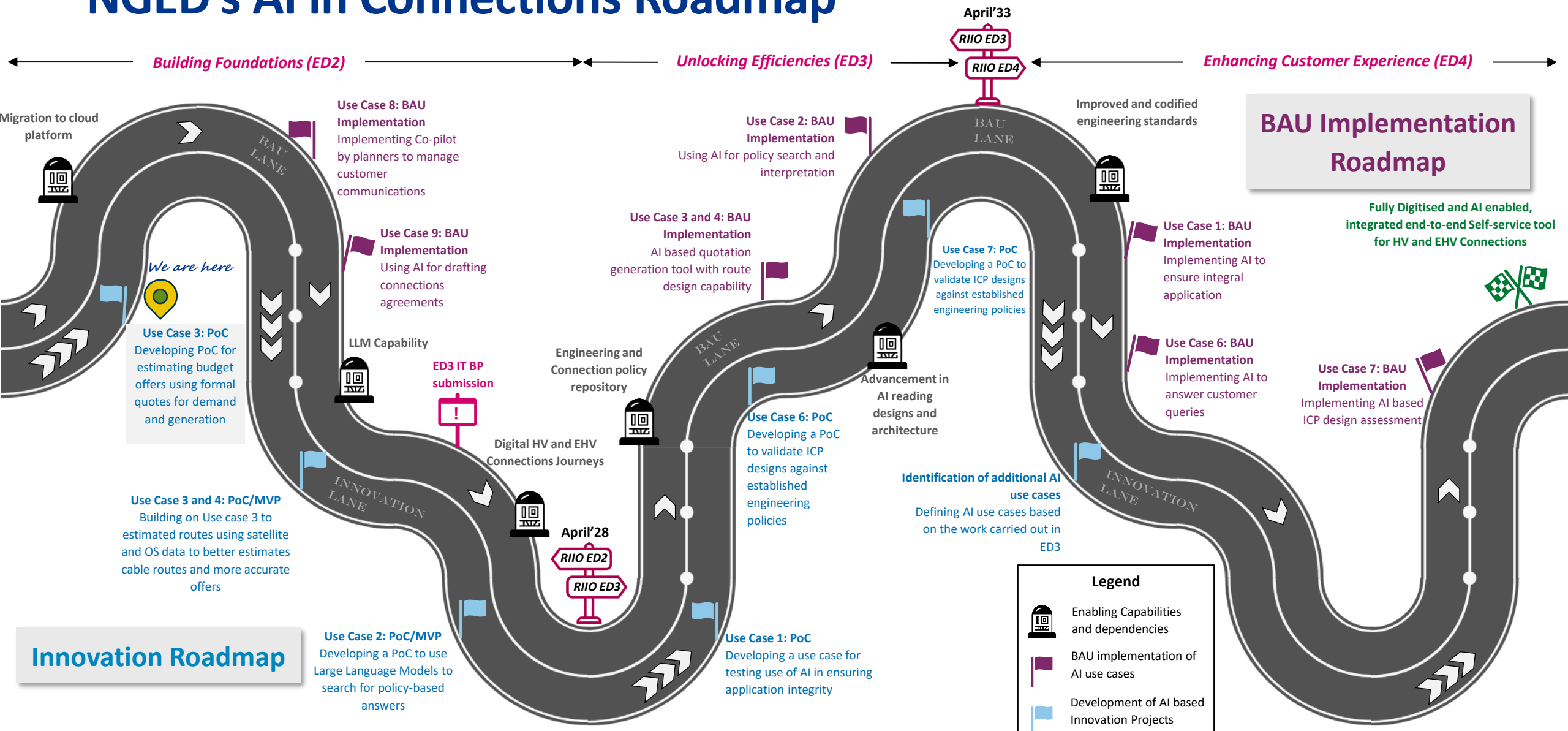
NGED's AI in Connections Roadmap



This roadmap outlines the suggested sequence of AI projects and use cases designated for the BAU and Innovation teams, respectively. The top half of the map describes the BAU implementation plan, and the bottom half represents the Innovation plan.

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