

## IPS Constructive Solutions Generator with NLP Text Ranker

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Intel Corporation



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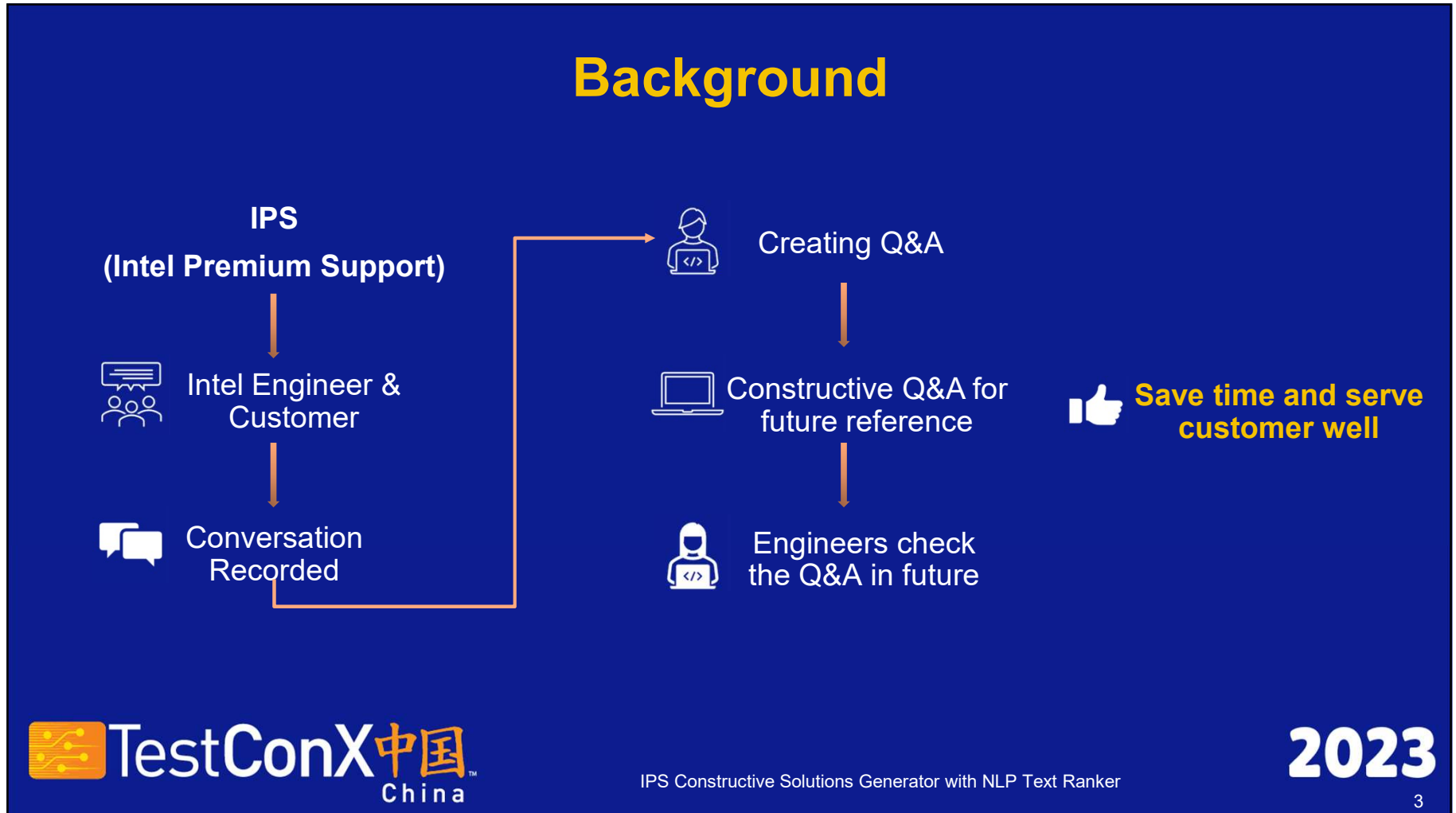


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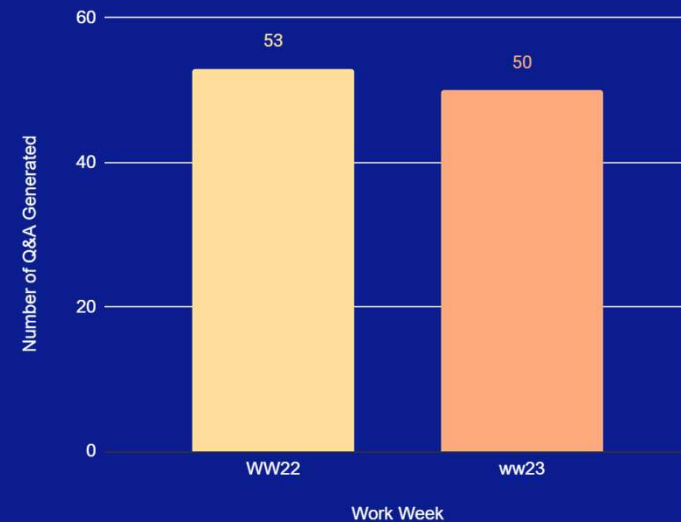
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## Problem Statement

- Most of the IPS tickets contain **lengthy** and **unconstructive** conversation between Intel engineer and customer
- Engineers must review the whole conversation and look for the solution from it. Then, they manually create the Q&A
- Engineer spend **one week time to create 50 Q&A**
- Huge manual effort and time effort

IPS Q&A Generated by Engineer



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## Introduction

- Constructive Solutions Generator (CSG) utilized the **NLP techniques**



- Full automation process
- Feed the Q&As into any solutions that is able to display the Q&A results



Save time

50 Q&As / week → 1000  
of Q&A/HOUR



Save manual  
effort



Up-to-date  
q&a

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## Objectives



### Objective 01

Solution in readable and sentence form



### Objective 02

Extract only main information



### Objective 03

Remove redundancy words



### Objective 04

Accuracy > 80%



### Objective 05

Feed the Q&As into the chatbot

## Objectives

Subject: BOM list of Brighton city CRB

Case Description: Dear support team, I have two requests for information of the Brighton city CRB. I guess you will provide the BOM list of the CRB. Could I have the expected release date? Do you have the plan to release Zuken CAD database of the Brighton city CRB? if yes, could you let me know the expected release date?

Yu Komatsubara y\_komatsubara@advantel.jp 8/4/2020 9:29 AM  
Dear Preethi,  
I downloaded them and confirmed that I think we can find almost all information we need from the files.  
Thank you very much.  
Yu

Preethi Sundaram Intel Technical Specialist preethi.sundaram@intel.com 8/1/2020 9:27 AM  
Hello,  
The Idaville LCC Brighton City schematic in Zuken format is available on the RDC - document # 626333.  
Thanks!  
Preethi

Preethi Sundaram Intel Technical Specialist preethi.sundaram@intel.com 4/30/2020 4:05 PM  
"Idaville LCC Brighton City BOM Report" is now available on RDC (# 626330). Thank!

Yu Komatsubara y\_komatsubara@advantel.jp 4/28/2020 11 PM  
Hi Preethi,  
There were two intentions behind the question: Power circuit validation and Performance evaluation.  
If the Turbo Boost does not so much change the ICs' power consumption behavior (especially current increase/decrease rates), I can wait in aspect of the power circuit validation.  
For the performance evaluation, I will wait for a few weeks.  
Thank you, Yu

Preethi Sundaram Intel Technical Specialist preethi.sundaram@intel.com 4/28/2020 12:01 PM  
Hello,  
One more question based on our latest meeting. There was a question of Turbo Boost being enabled on E82 prime. What kind of testing are you intending to do. Is there a possibility I wait till Q4? I am still finding out if it will be enabled. Will get back to you.  
Preethi

Yu Komatsubara y\_komatsubara@advantel.jp 4/28/2020 9:38 PM  
Dear Preethi,  
I understand. Thank you.  
I will wait for a few weeks.  
Best regards,  
Yu

Preethi Sundaram Intel Technical Specialist preethi.sundaram@intel.com 4/6/2020 10:45 AM  
Hello,  
The BOM file is still a few weeks away. As soon as it is on RDC, I will reach out to you.  
Thanks!  
Preethi

Yu Komatsubara y\_komatsubara@advantel.jp 4/6/2020 3:43 AM  
Dear Preethi,  
Thank you for the Zuken format request.  
For the BOM file, I can find schematics and board file on RDC. But BOM list (usually in Excel spreadsheet) is not available. Is this just I am not authorized for the document?  
Yu

Preethi Sundaram Intel Technical Specialist preethi.sundaram@intel.com 4/3/2020 9:23 AM  
Hello,  
The latest schematics are already posted on RDC. Please do have a look. The Zuken format has been requested to our internal team that is converting schematics. We should have it on RDC within the next 10 days.  
Preethi

## Output in Chatbot

CSG Transforming

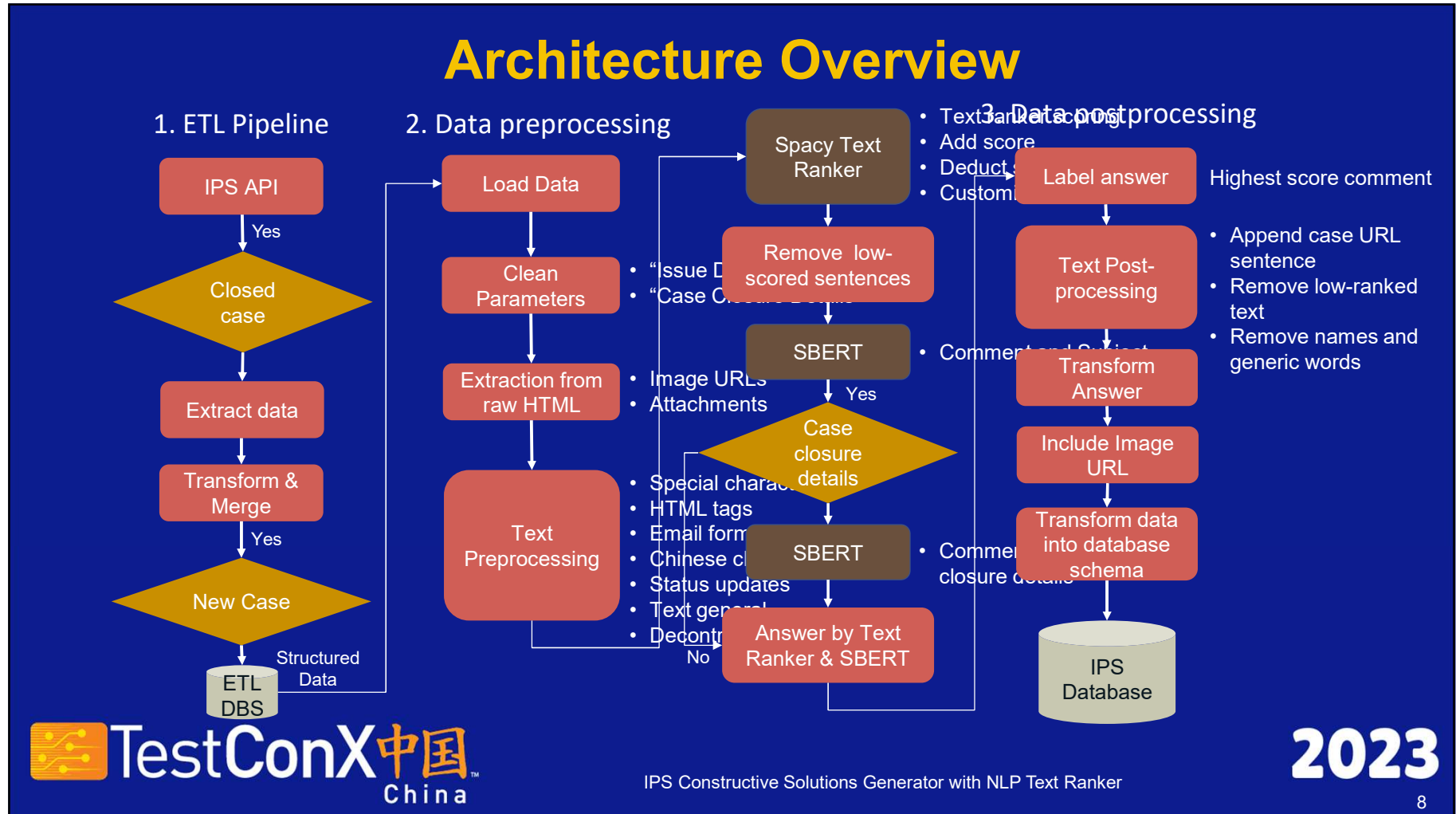


I found this FAQ related to Reference Board - BOM list of Brighton city CRB

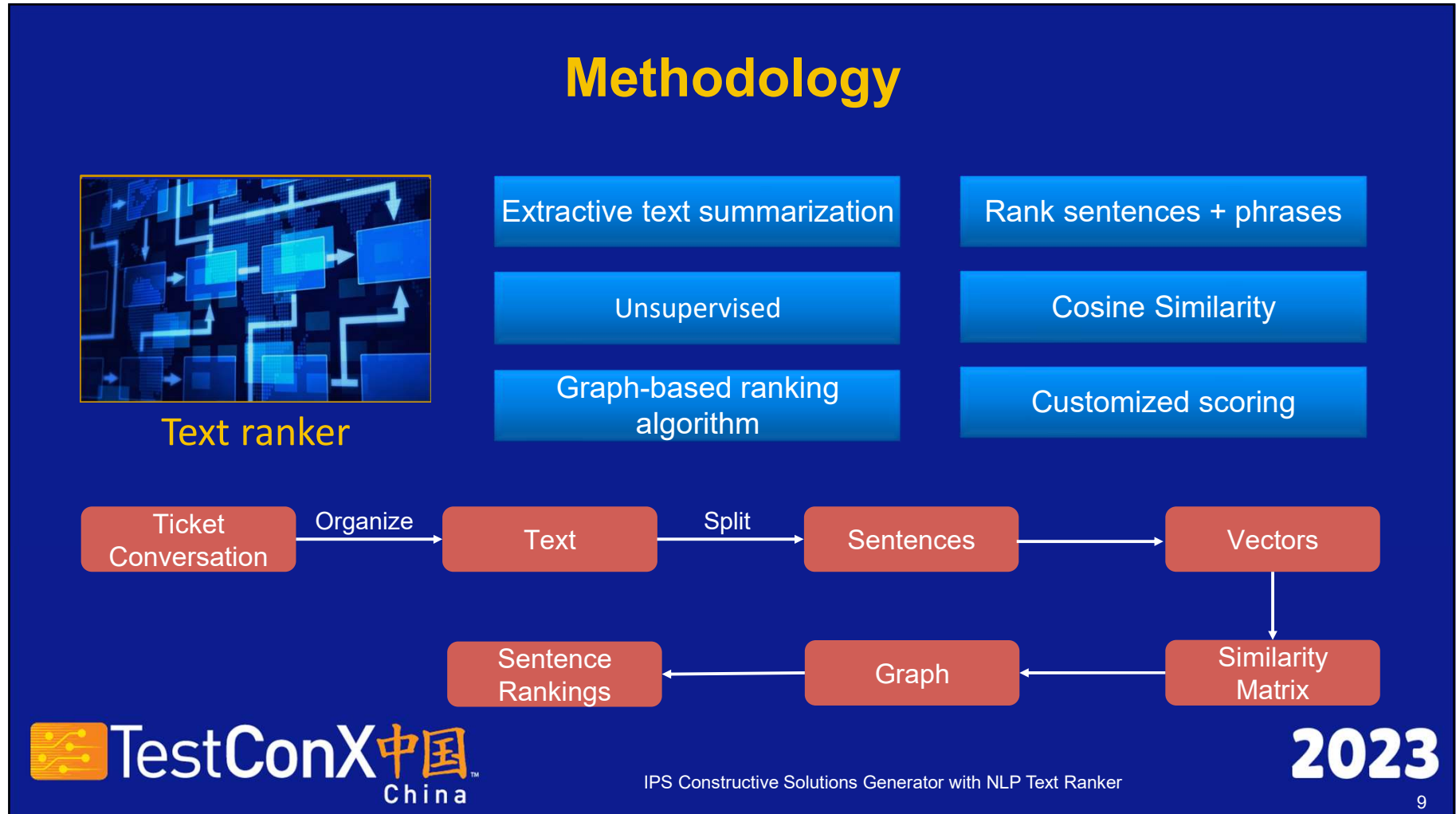
Solutions:

The Idaville LCC Brighton City schematic in Zuken format is available on the RDC document 626333.  
For more information, please refer to <https://intel.lightning.force.com/lightning/r/Case/5003b00001U0QxfAAF/view>

[Case URL Link](#)








## Methodology

- Cosine similarity**      Sentences that has similar meaning
- Process two sentences simultaneously**
- Modification of BERT network**
  - Siamese network
  - Triplet network
  - Create sentence embeddings for each sentence
- Semantic search**      Few seconds of training time
- Avoid unrelated sentence**

```
graph TD; SA[Sentence A] --> B1[Bert]; SB[Sentence B] --> B2[Bert]; B1 --> MP1[Mean Pooling]; B2 --> MP2[Mean Pooling]; MP1 --> U[u]; MP2 --> V[v]; U --> CS[Cosine similarity (u,v)]; V --> CS; CS --> SS[Similarity Score]; SS --> TK[Top K sentence];
```

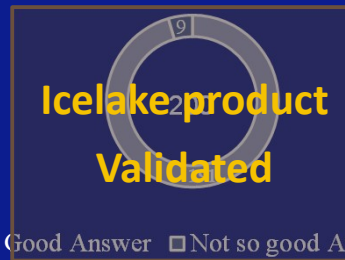


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## Results

**95%**  
Accuracy

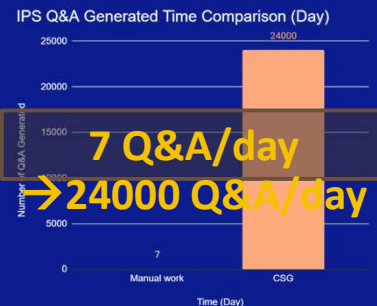


**80%**  
Words Shortened

Summarized Answer

1)Based on Idaville BWG (BIOS Writer's Guide, Doc ID # 616770) section 7.11.5 Data Scrambling with Address & 7.11.8 Demand and Patrol Scrubbing  
" Feature control: Data Scrambling feature can be enabled/disabled using a MRC input parameter. Platform Reference Code configures this mode upon system reset."  
These features can be enabled/disabled through BIOS. Since I do not have a CRB, I cannot verify if this option is present in setup option in Intel BIOS reference code (like in old platforms). I am trying to find answers to posts who can confirm my understanding.  
2)can these features impact memory performance? I.e. features should not impact latency/performance/bandwidth.  
Instead Memory Data Scrambling with Command and Address (R\_MEM07) and Memory Demand and Patrol Scrubbing (R\_MEM08) - these RAS features are used to maintain memory data integrity and protect data stored in DDR4 DIMMs against various faults. Kindly refer Idaville EDS (Doc ID # 595910) section 7.4 Memory Sub-System RAS Features (specifically section 7.4.7 and 7.4.8) for further read.  
Please revert in case of further doubts/questions after reading through these sections.  
For more information, please refer to  
<https://intel.lightning.force.com/lightning/r/Case/5003b0001TGkoAAD/view>

**3400X**  
Save Time



**Fed QnA into chatbot**

I found this FAQ related to Platform - Ethernet application

Solutions:

There is some feedback based on the latest revision of PDG#576513, Table 7-1 Network Link mode must be maintained for entire quad. Network Link modes permitted for 2 different quads.  
Hence there shall be concern on your below implementation, as seem like there is mis-implementation.  
For more information, please refer to the link below.  
<https://intel.lightning.force.com/lightning/r/Case/5003b0001TEAZAA5/view>

Figure 1

Case URL Link

## Summary

Use NLP techniques to **generate Q&As** from IPS tickets

**Text Ranker** and **SBERT** algorithm to extract solution from lengthy conversation



Full Automation



Save Time



Improve Efficiency



Save Manual Effort

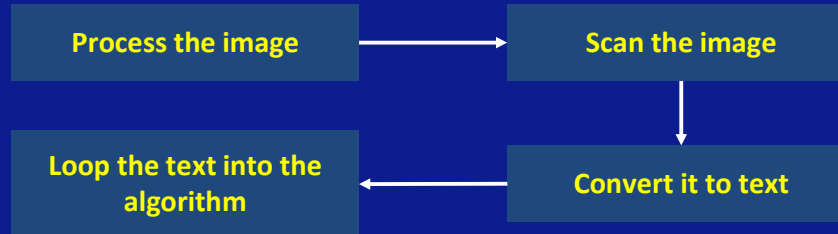
## Future Plan



Image processing



Answer classification



- Build an own model to classify answer
- Using the Q&As that have been created as training data

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