ENI ISG PoC Report Template

1 General

The following normative disclaimer shall be included on the front page of a PoC report:

Submission of this ENI ISG PoC Report as a contribution to the ENI ISG does not imply any endorsement by the ENI ISG of the contents of this report, or of any aspect of the PoC activity to which it refers.

2 ENI ISG PoC Report

2.1 PoC Project Completion Status

Indicate the PoC Project Status. Can the PoC be considered completed? If this is a multi-stage PoC project, indicate the Reported Stage status and plans for future Project Stages/Milestones:

- Overall PoC Project Completion Status: **Completed**

2.2 ENI PoC Project Participants

Specify PoC Team; indicate any changes from the ENI ISG PoC Proposal:

- PoC Project Name: **AI based family broadband network user experience optimization**

- Network Operator/Service Provider: **China Mobile**

  Contact: **Jian Huang (huangjian3@cq.chinamobile.com)**

- Manufacturer A: **AsiaInfo Technologies Inc**

  Contact: **Shoufeng Wang (wangsf11@asiainfo.com)、Jianchao Guo（guojc3@asiainfo.com）、Sen Bian(biansen@asiainfo.com）**

- Manufacturer B: **Intel Corporation (UK) Ltd**

  Contact: **Haining Wang(haining.wang@intel.com)、Tong Zhang（tong2.zhang@intel.com）**

## 2.3 Confirmation of PoC Event Occurrence

To be considered as complete, the PoC should have been physically demonstrated with evidences extracted from the demonstration, i.e. the following information should be provided:

- **ETSI ENI #23 plenary meeting, online, September 05, 2022**

  This PoC was approved to start at ENI#23 plenary meeting. Asiainfo as reporter introduced the team members, technical background, research objectives, and progress milestones information, etc.

- **ETSI ENI #24 plenary meeting, online, December 12, 2022**

  This meeting introduced the complete architecture of this PoC, including the types of collected data, data processed capabilities, model trained process, functional set, etc.
  Intel provided hardware environment support for this PoC. Using Chongqing Mobile as a pilot for verification. Presented the functional information of this PoC in demo format.

The customer experience management system evaluates overall customer's service level, network quality and usage perception from the perspective of user experience, takes the user experience as the initiative to analyze the weaknesses in the business process, and then distributes them to the corresponding surrounding system for maintenance and support to achieve proactive customer care, solve the difference between the individual and the whole perception, improves the customer experience of home broadband network.
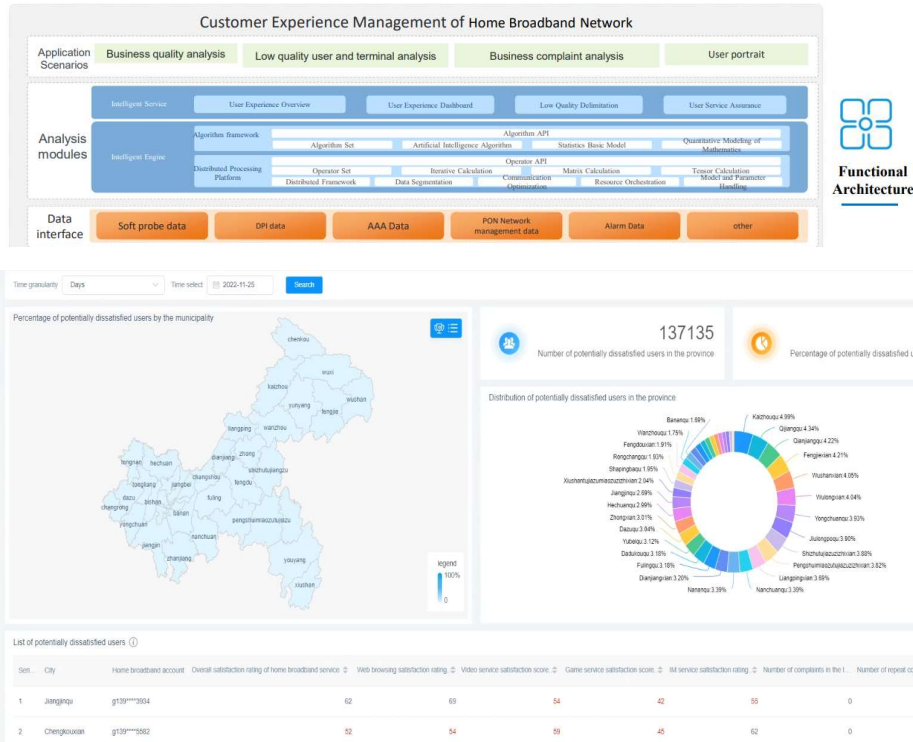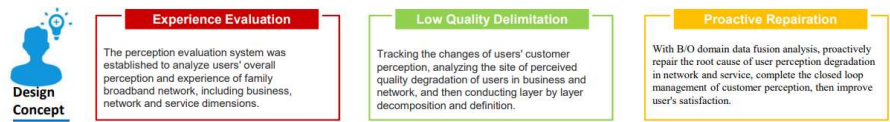
- **ETSI ENI #25 plenary meeting, online, March 08, 2023**

  This meeting mainly introduced the contribution of this PoC to the standard and the promotion and application of the PoC concept in other provinces.

  - **contribution**
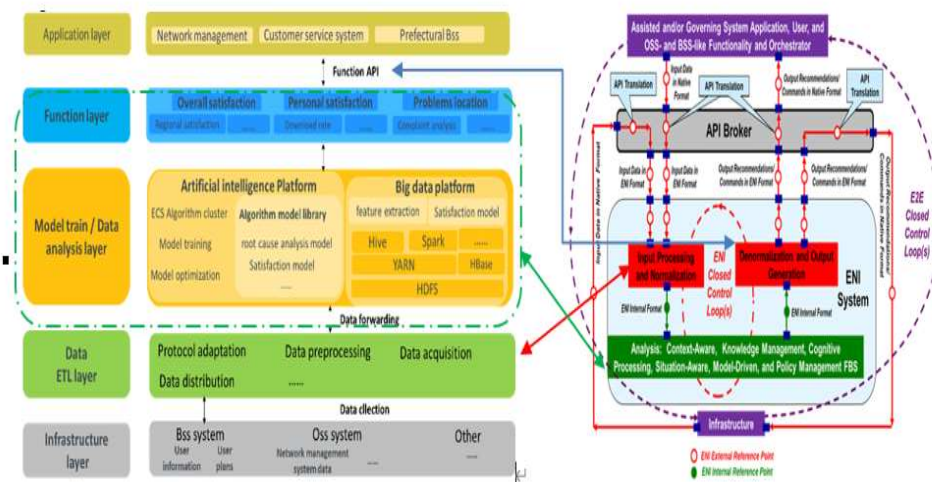
- **promotion**

Promotion of PoC application

The successful practice of PoC in Chongqing has promoted operators' interest. The following figures show the promotion situation in Guizhou Province. The main construction contents include the analysis of satisfaction of family broadband, the analysis of end-to-end quality of business and the analysis of Internet TV.
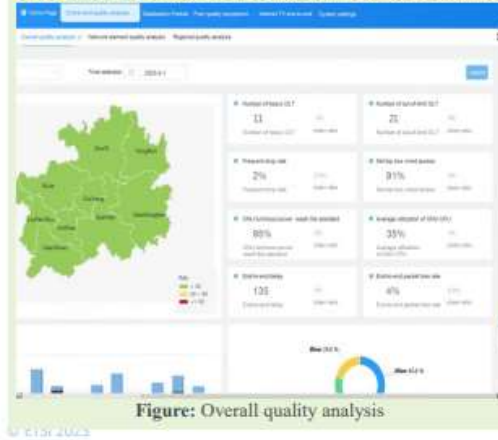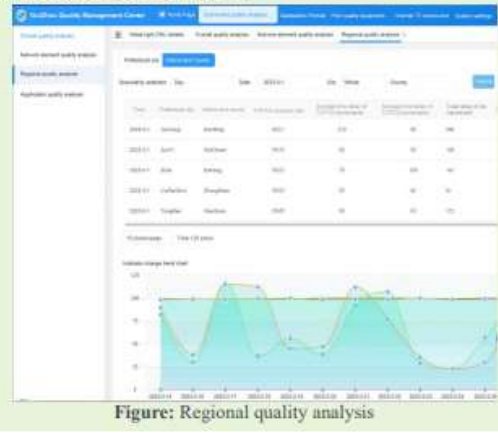
Figure: Overall quality analysis   **Figure:** Regional quality analysis

Promotion of PoC application

The dashboard shows user's personal package information, network information and experience rating information.

The dashboard shows the business operation trend information of Internet TV network hardware equipment, etc.

Figure User satisfaction portrait   **Figure** Internet TV terminal satisfaction

- **2023 China Cloud Network Conference, Beijing, May 09-10, 2023**

The PoC solution and status were introduced at Autonomous Network Forum during the 2023 **China Cloud Network Conference.**
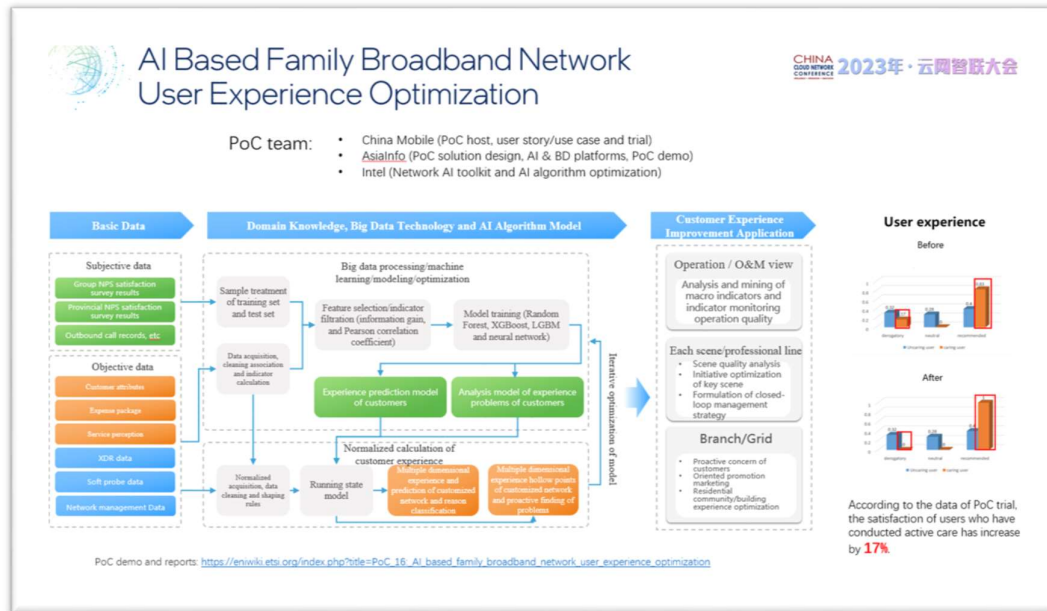
2.4 PoC Goals Status Report

Specify PoC Goals from ENI ISG PoC Proposal (clause A.1.2). Identify any changes from the original ENI ISG PoC Proposal with an explanation as to why the changes were made. Indicate the extent that each goal was met. Provide sufficient information for those not familiar with the PoC goals to understand what has been achieved and/or learned.

- PoC Project Goal #1: **Demonstrate user experience perception assessment system. Select KPI （Key Performance Indicators) affecting user experience to construct user experience perception assessment system, including user subjective assessment and system objective assessment.**

  Goal Status (Demonstrated/Met?) **Demonstrated.**

- PoC Project Goal #2: **Demonstrate using big data, AI technology and expertise to train AI model of family broadband network user experience optimization, analyse user experience data, solve user experience problem and improve user experience perception.**

  Goal Status (Demonstrated/Met?) **Demonstrated.**

  Based on big data analysis technology and machine learning algorithm, establishes the multi-dimensional customer perception analysis model and evaluation system of home broadband network. With customer satisfaction survey data as the training sample set, the model is iterated constantly to optimize the evaluation system.
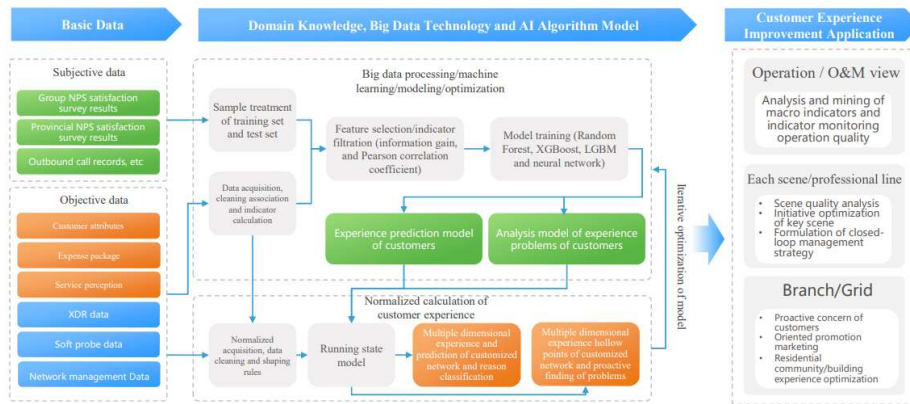
The PoC team built the demo with:

Hardware environment:

- o Intel® Xeon® Gold 6330N @ 2.20GHz

- o 2 CPUs (NUMA) x 28 cores x 2 hyper-threads

- o Intel® Hyper-Threading Technology: on

- o Intel® Turbo Boost Technology: on

- o Intel® Ethernet Controller XXV710 25GbE

Software environment:

- o Intel ® distribution of Python

- o Intel ® Optimized Scikit-learn

- o Intel ® Optimized XGBoost

- o Intel ® OneDAL

- o Intel ® OneDNN

And according to the data of the PoC trial, the satisfaction rate of users who have conducted active care has increased by **17%**, with obvious effect.

The hardware features of Intel Xeon systems such as AVX512 and VNNI support efficient implementation of the AI components, and Intel AI acceleration libraries and optimized AI frameworks used in the software stack of the PoC guaranteed real-time performance of the proposed solution.

2.5   PoC Feedback Received from Third Parties (Optional)

Where applicable, provide in a free text, feedback received from potential customers, Ecosystem partners, event audience and/or general public.

3 ENI PoC Technical Report (Optional)

3.1 General

PoC Teams are encouraged to provide technical details on the results of their PoC using the PoC Scenario Report template below.

3.2 PoC Contribution to ENI ISG

Use table B.1 to list any contributions to the ENI ISG resulting from this PoC Project.

Table B.1

Contribution	WG	WI/Document Ref	Comments
ENI(22)024_018r2_supplement use case 5.4.8.3	ENI	ETSI GS ENI 001 Use Cases	This contribution complements case 3.8, including the mapping between PoC architecture and ENI architecture, information flow, etc.
ENI(22)000_170_Add use case #3-8	ENI	ETSI GS ENI 001 Use Cases	This contribution added a new case about AI based family broadband network user experience optimization.

3.3 Gaps identified in ENI standardization

3.4 PoC Suggested Action Items

3.5 Additional messages to ENI

3.6 Additional messages to Network Operators and Service Providers

This PoC demonstrates again that the Intel Xeon system and Intel AI acceleration libraries and toolkits which are widely deployed in current network infrastructure can provide good performance for Network AI use case.