Title*: AI based family broadband network user experience optimization

from Source*: AsiaInfo Technologies Inc, Intel Corporation (UK) Ltd, China Mobile
Contact: Sen Bian, Jianchao Guo, Haining Wang, tong zhang

input for Committee*: ENI

Contribution For*: Decision X
Discussion
Information

Submission date*: 2022-08-26

Meeting & Allocation: ENI-#23
Relevant WI(s), or deliverable(s):

Decision requested: Please approve

ABSTRACT: This contribution proposes to start a PoC project on AI based family broadband network user experience optimization
ENI ISG - PoC Proposal Template

1 PoC Project Details

1.1 PoC Project

PoC Number (assigned by ETSI):
PoC Project Name: AI based family broadband network user experience optimization
PoC Project Host: China Mobile

Short Description:
This PoC provide a solution for family broadband network user experience optimization. In this PoC, we will select KPI (Key Performance Indicators) affecting user experience to construct evaluation system of family broadband user perception, and train AI model of family broadband network user experience optimization. We will deploy AI model of family broadband network user experience optimization in OSS system and analyze user experience data to generate user experience optimization policy.

1.2 PoC Team Members

<table>
<thead>
<tr>
<th>Organization name</th>
<th>ISG ENI participant (yes/no)</th>
<th>Contact (Email)</th>
<th>PoC Point of Contact (see note 1)</th>
<th>Role (see note 2)</th>
<th>PoC Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>China Mobile</td>
<td>yes</td>
<td><a href="mailto:huangjian3@cq.chinamobile.com">huangjian3@cq.chinamobile.com</a></td>
<td>Operator</td>
<td>User story/use case and trial.</td>
<td></td>
</tr>
<tr>
<td>Asiainfo</td>
<td>yes</td>
<td><a href="mailto:biansen@asiainfo.com">biansen@asiainfo.com</a>, <a href="mailto:guoscopic@asiainfo.com">guoscopic@asiainfo.com</a>, <a href="mailto:zhanggh3@asiainfo.com">zhanggh3@asiainfo.com</a>, <a href="mailto:wanyyl27@asiainfo.com">wanyyl27@asiainfo.com</a></td>
<td>X</td>
<td>Manufacturer</td>
<td>PoC solution design, AI &amp; BD platforms, PoC demo.</td>
</tr>
<tr>
<td>Intel</td>
<td>yes</td>
<td><a href="mailto:haining.wang@intel.com">haining.wang@intel.com</a>, <a href="mailto:tong2.zhang@intel.com">tong2.zhang@intel.com</a></td>
<td>Manufacturer</td>
<td>Network AI toolkit and AI algorithm optimization.</td>
<td></td>
</tr>
</tbody>
</table>

NOTE 1: Identify the PoC Point of Contact with an X.
NOTE 2: The Role will be network operator/service provider, infrastructure provider, application provider or other as given in the Definitions of ETSI Classes of membership.

All the PoC Team members listed above declare that the information in this proposal is conformant to their plans at this date and commit to inform ETSI timely in case of changes in the PoC Team, scope or timeline.

1.3 PoC Project Scope

1.3.1 PoC Goals

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.

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

1.3.2 PoC Topics

PoC Topics identified in this clause need to be taken for the PoC Topic List identified by ISG ENI and publicly available, i.e. the three topics identified in clause 4.5 of the ENI PoC Framework. PoC Teams addressing these topics commit to submit the expected contributions in a timely manner.
Table A.2

<table>
<thead>
<tr>
<th>PoC Topic Description (see note)</th>
<th>Related WI</th>
<th>Expected Contribution</th>
<th>Target Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI based family broadband network user experience optimization</td>
<td>GS ENI 001 Use Cases</td>
<td>New contributions to the use case #3-8 AI based family broadband network user experience optimization</td>
<td>Dec. 2022</td>
</tr>
<tr>
<td></td>
<td>GS ENI-002 Requirements</td>
<td>New requirements to support AI based family broadband network user experience optimization.</td>
<td>Dec. 2022</td>
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</tbody>
</table>

NOTE: This column should be filled according to the contents of table 1.

1.4 PoC Project Stages/Milestones

Table A.4

<table>
<thead>
<tr>
<th>PoC Milestone</th>
<th>Stages/Milestone description</th>
<th>Target Date</th>
<th>Additional Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.S</td>
<td>PoC Project Start</td>
<td>09/2022</td>
<td></td>
</tr>
<tr>
<td>P.D1</td>
<td>PoC Demo 1</td>
<td>12/2022</td>
<td>Demo at an ENI plenary meeting</td>
</tr>
<tr>
<td>P.C1</td>
<td>PoC Expected Contribution 1</td>
<td>12/2022</td>
<td>Contribution to ENI Requirements</td>
</tr>
<tr>
<td>P.C2</td>
<td>PoC Expected Contribution 2</td>
<td>03/2023</td>
<td>Contribution to ENI Use Cases</td>
</tr>
<tr>
<td>P.R</td>
<td>PoC Report</td>
<td>06/2023</td>
<td>PoC-Project-End Feedback</td>
</tr>
<tr>
<td>P.E</td>
<td>PoC Project End</td>
<td>07/2023</td>
<td>Presented to ISG ENI for information</td>
</tr>
</tbody>
</table>

NOTE: Milestones need to be entered in chronological order.

2 PoC Technical Details

2.1 PoC Overview

In this PoC, family broadband network user experience optimization system will get massive history data from infrastructure, including OSS data, BSS data and customer’s subjective evaluation and complaint data e.g., net promoter score data. These history data will be used to train customer experience model, and the qualified customer experience model will be stored in the family broadband network user experience optimization system. Family broadband network user experience optimization system will get periodic operation data form infrastructure, analyse and obtain poor quality users and the root causes of poor quality, and determine the optimization policy.

2.2 PoC Architecture

As show in fig. 1, this PoC architecture include five parts.
**Infrastructure layer**: produce user experience data, including OSS data, BSS data, etc.

**Data ETL (Extract-Transform-Load)**: dispose of data, including data acquisition, data preprocessing, data distribution, etc.

**Model train and data analysis layer**: be used to model training and data analysis, etc.

**Function layer**: provide satisfaction problems processing function, including degree of satisfaction of collective and personal, problems location, etc.

**Application layer**: receive user experience optimization policy, and dispose user experience problems

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**2.3 PoC Success Criteria**

All goals are met when the described functionality is proved to be available.

**2.4 Additional information**

Corresponding ENI use case #3-8 was approved in ENI(22)000_170 at the Rapp Call#223 and ENI email list.