



Innovations in Clouds,
Internet and Networks

19th
ICIN
CONFERENCE

PARIS
MARCH 1 - 3, 2016

Subjective Perception Scoring

Jörg Niemöller
Nina Washington



Net Promoter Score and its Derivatives

Score per organization

Measures a fraction of the user base

Available after a survey



Individual Subjective Perception Scores

Score per user individually

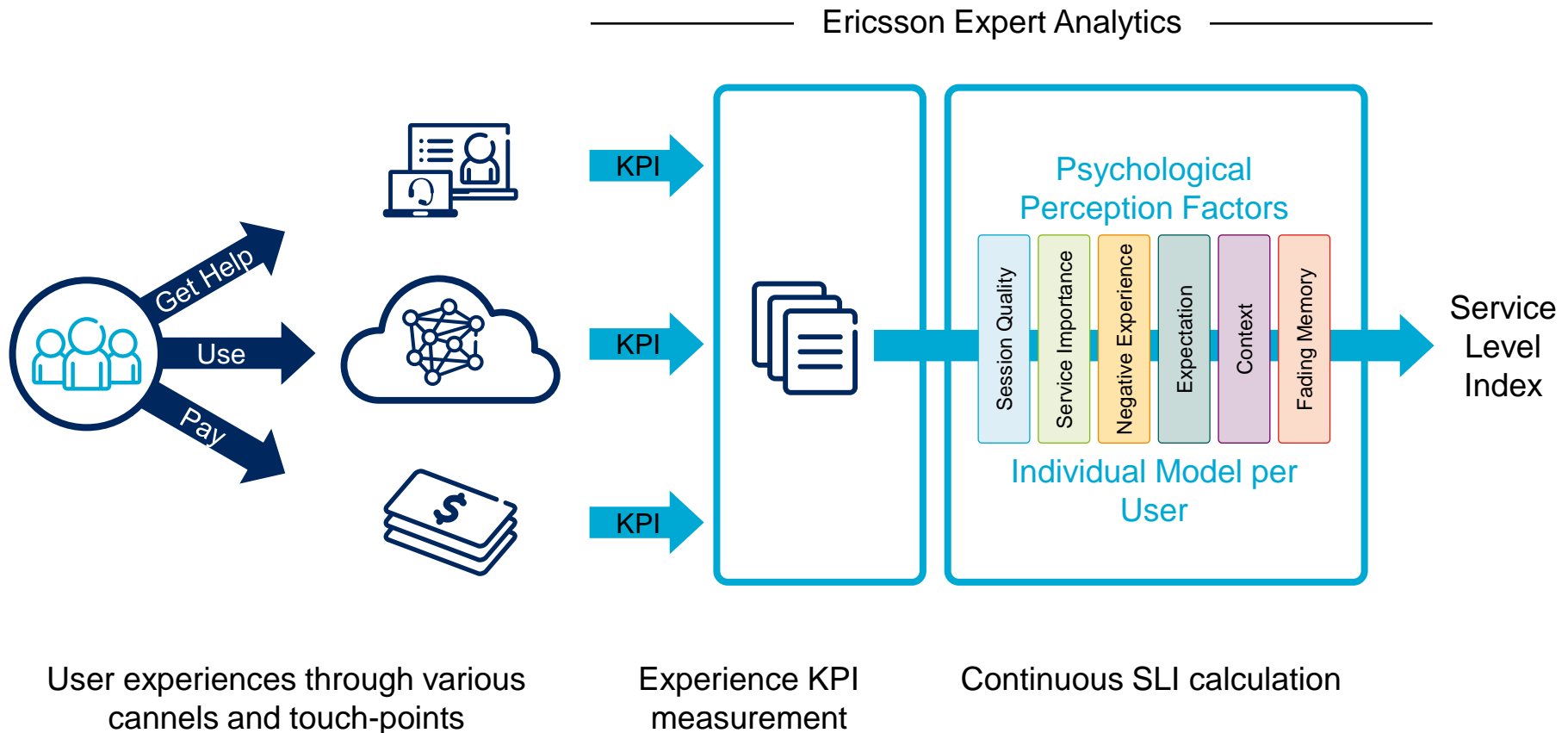
Available for every user

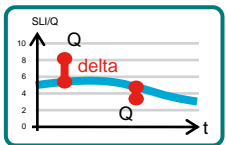
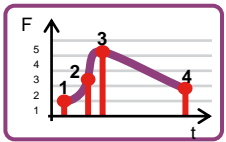
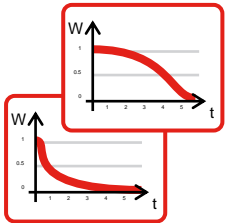
Continuously updated

The SLI predicts what a user would answer if asked directly to state his/her satisfaction

$$SLI_n = \frac{\sum_{i=1}^n Q_i W_i}{\sum_{i=1}^n W_i}$$

- The SLI captures the **entire experience history** and not only the perception of single services
- The SLI is a **weighted average** over all service usage experiences
- The weight W expresses the **significance of single experiences** within the overall experience history
- Calculated based on **S-KPI** and network measurements





- Individual perception of presented service quality
 - Every user has different expectations and preferences
- Negative experience is more significant
- Fading memory of older experience
 - Users forget experiences over time
 - Memory is different for different events
 - More significant experiences are remembered longer
- Correlation of multiple events
 - Several events happening together are perceived differently than single events
- Experiences that differ from usual level are more significant
- Context of service usage
 - The situation of the service usage influences perception
e.g.: location car/home, consumed media content, date & time of usage, weather, ...

› Defined by user segmentation

- Static user groups based on for example age, high usage, location, terminal type, price plan, private/business and local customer segments like traditionalist or early adopters
- Dynamic user groups based on behavior:
e.g. heavy video usage being the 10% most active video users
- Can support any user segmentation model

› Determine model parameterization for a typical user of each user-group

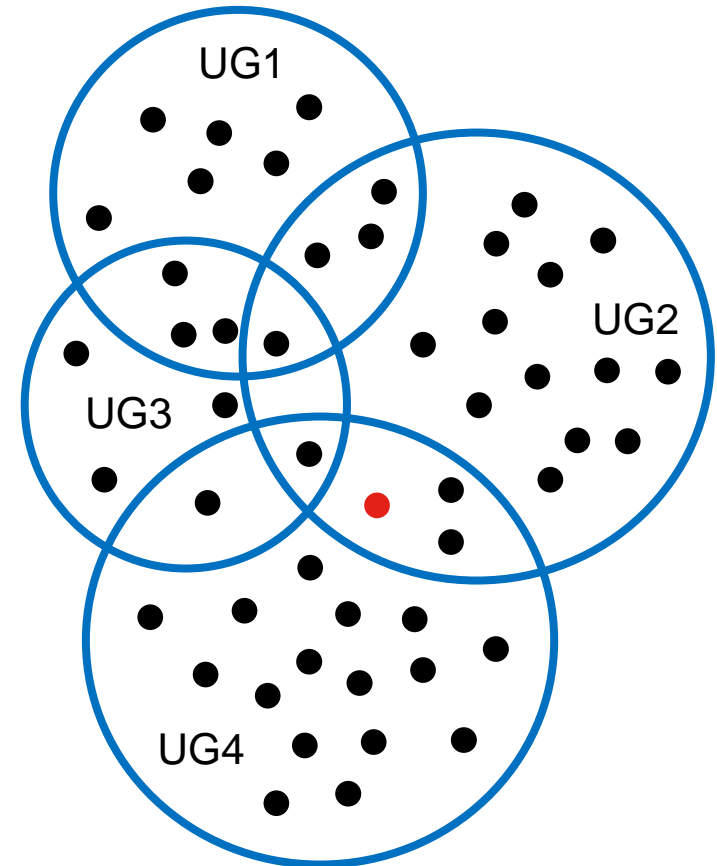
- Based on experience from user surveys

› Calculate a user's individual scoring parameters

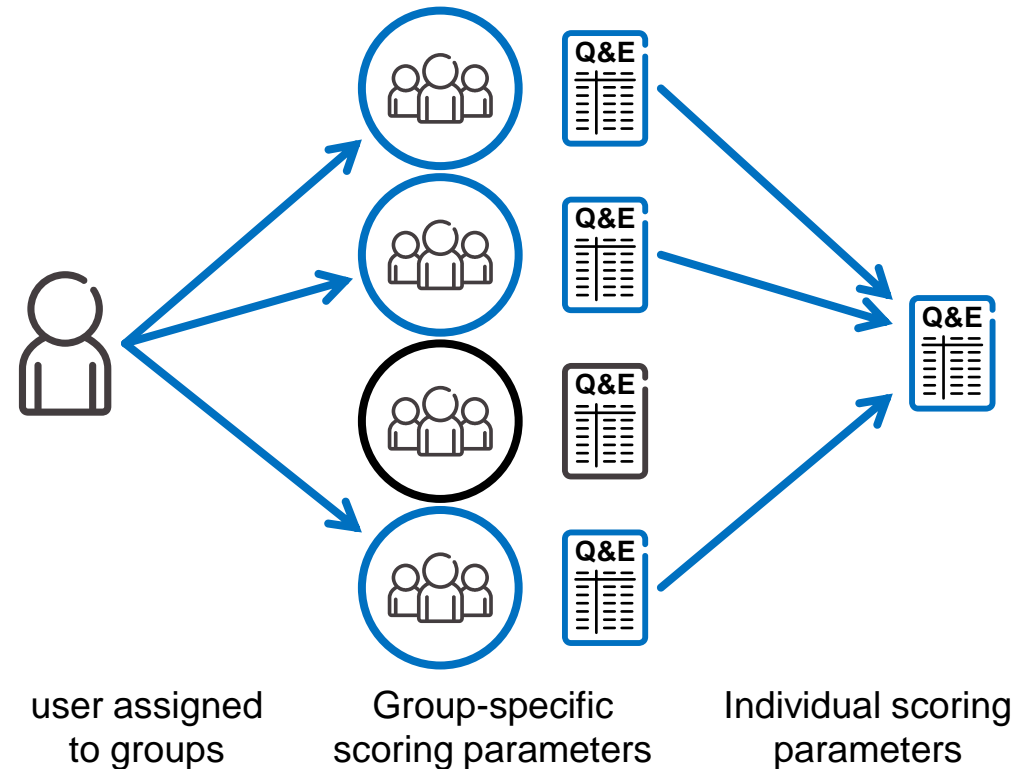
- Based on group specific scoring models and of a user's group memberships (e.g. average)

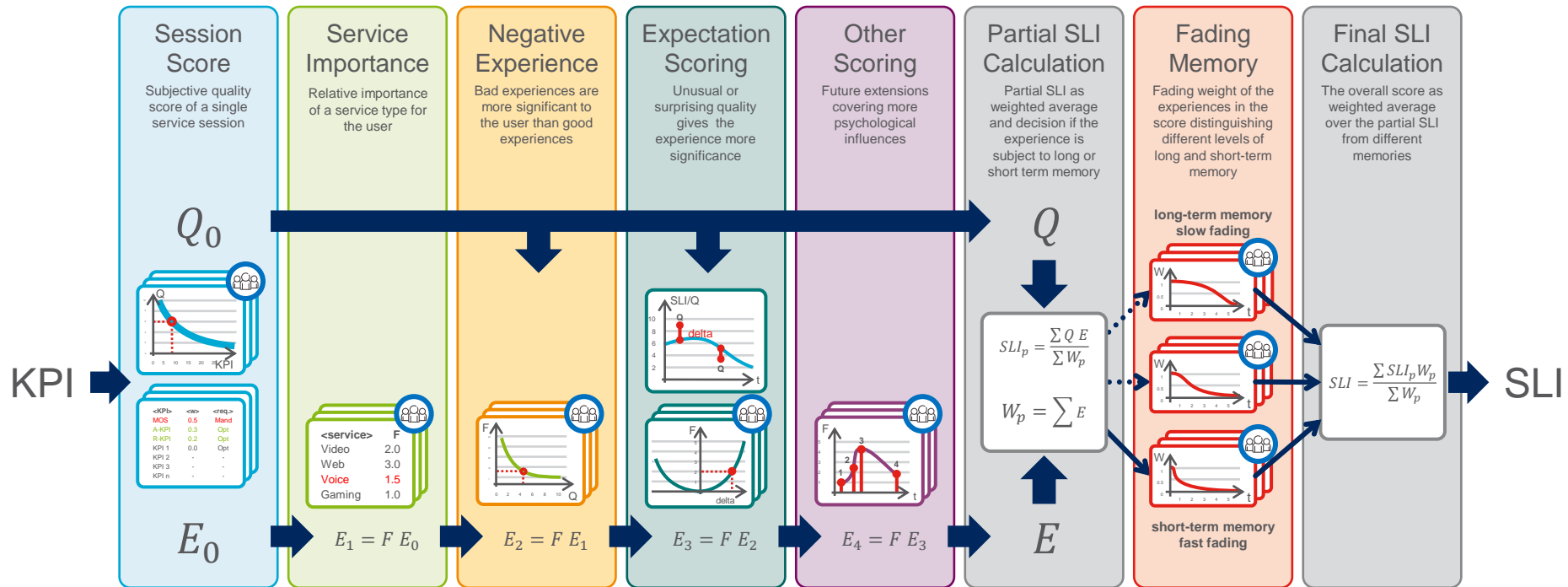
› User assignment to groups is continuously updated

- Creating latest individual scoring models

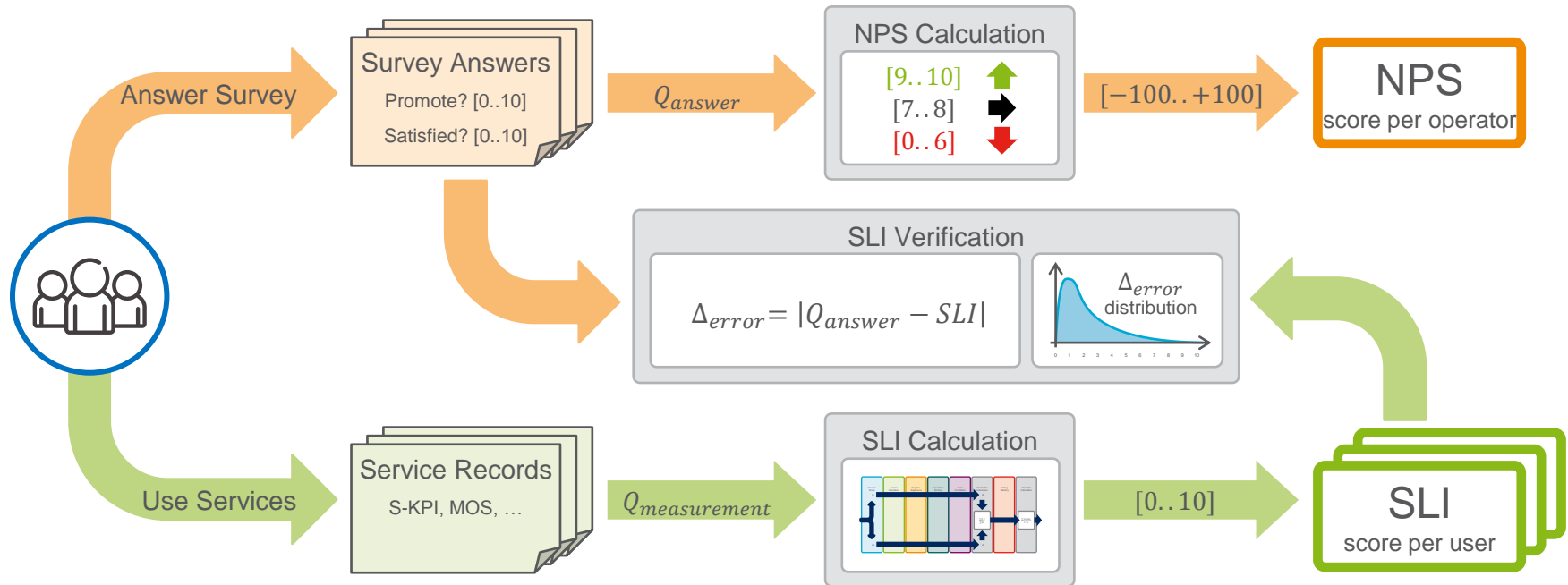


- › A user is assigned to **user groups**:
e.g. heavy video user, business user,
below 20 years old, traditionalist,
premium data plan, ...
- › Each user group corresponds to model
parameters that expresses the **typical
perception** of users within this group.
E.g. heavy video users are expected to
be more sensitive to video streaming
quality.
- › The user's individual score table is a
combination of all user group specific
tables of the groups the user belongs
to.

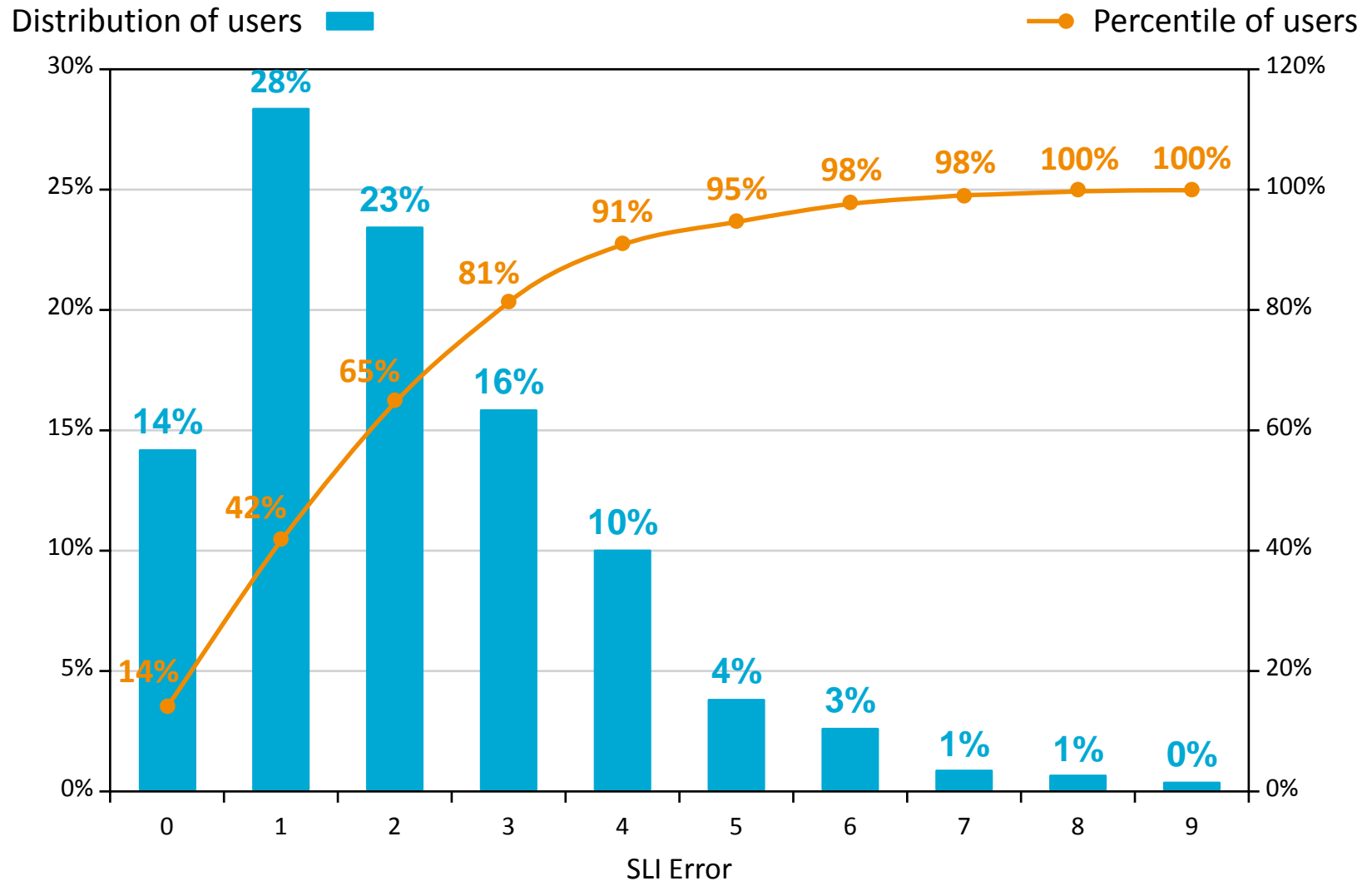


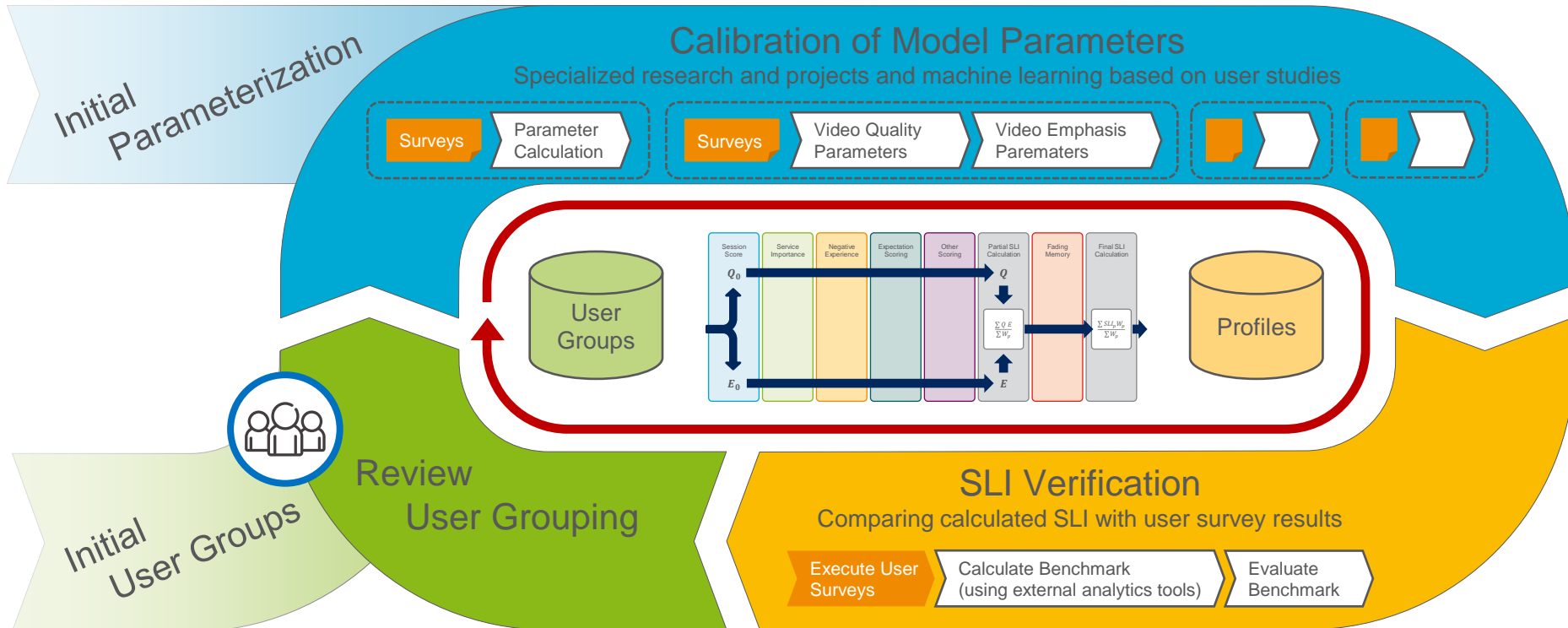


- Separation of concerns: A model of sub-models
- Parameters connected to psychological properties
- Stream processing and real-time enabled



- Comparing the SLI prediction with user feedback
- Can use individual answers from NPS surveys
- Can be executed whenever an NPS survey is done





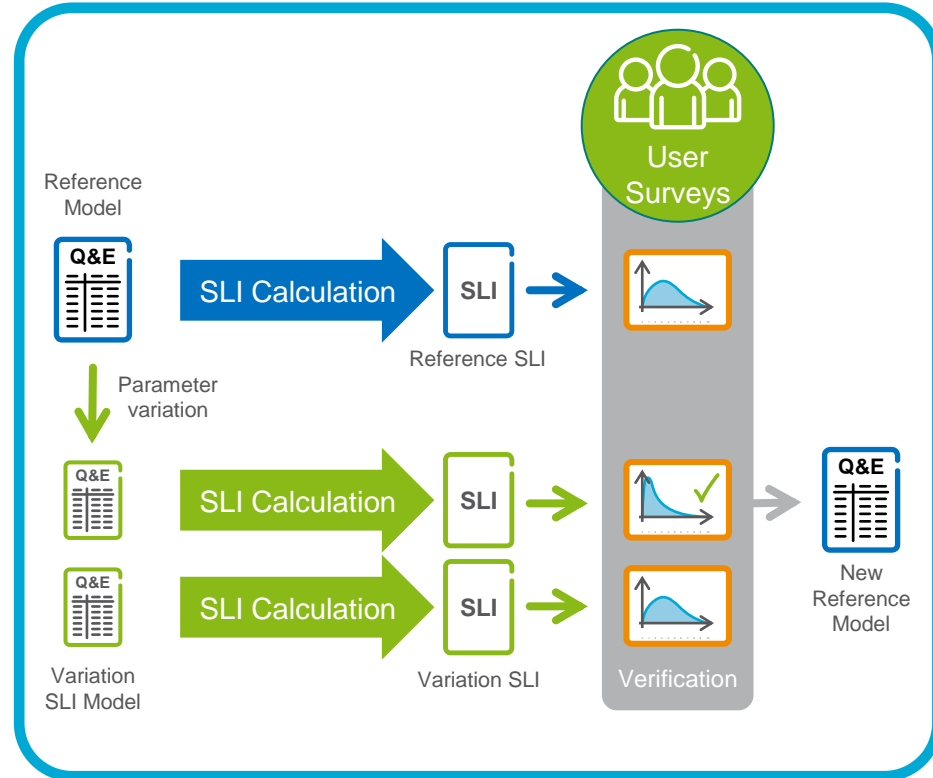
- The scoring pipeline is a hypothesis for a user survey based machine learning process
- Continuous verification and improvement with every user survey

Surveys regarding
single service quality perception

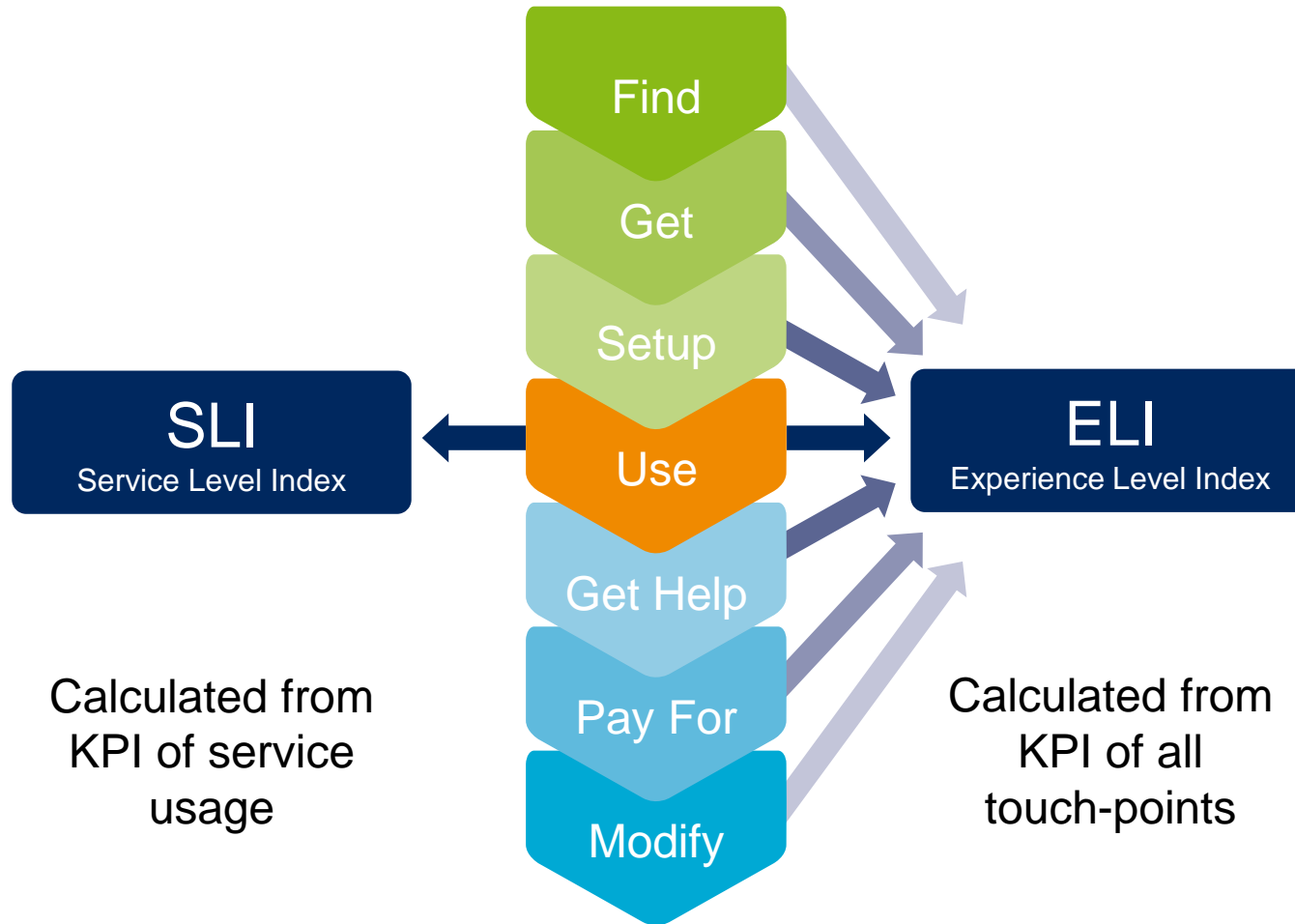


Regression finding best model
parameters per user group

Surveys regarding
overall satisfaction



Continuously learn and
optimize the model



- Using the psychological SLI model to assign a perception score to a technical asset
(e.g. Radio Cell, Video Server, Device Type, ...)
 - All KPI of sessions with the asset involved will be considered.
 - The model parameters will be dynamically adapted to the user, who has made this experience.
- Allows better evaluation of which network asset is involved in good and bad experiences
- Transition from objective evaluation of performance to the question of how the asset contributes to user experience

- From survey based insights towards predictive scores
- From organization level insights towards individual users
- From objective metrics towards subjective perception
- Enabler for new use cases and improved customer experienced management
 - Individualized marketing
 - Personalized communication and omni-channel
 - Experience based network investments



Innovations in Clouds,
Internet and Networks

19th
ICIN
CONFERENCE

PARIS
MARCH 1 - 3, 2016

Thank you!



ERICSSON