



# Center for Robots and Sensors for the Human Well-being



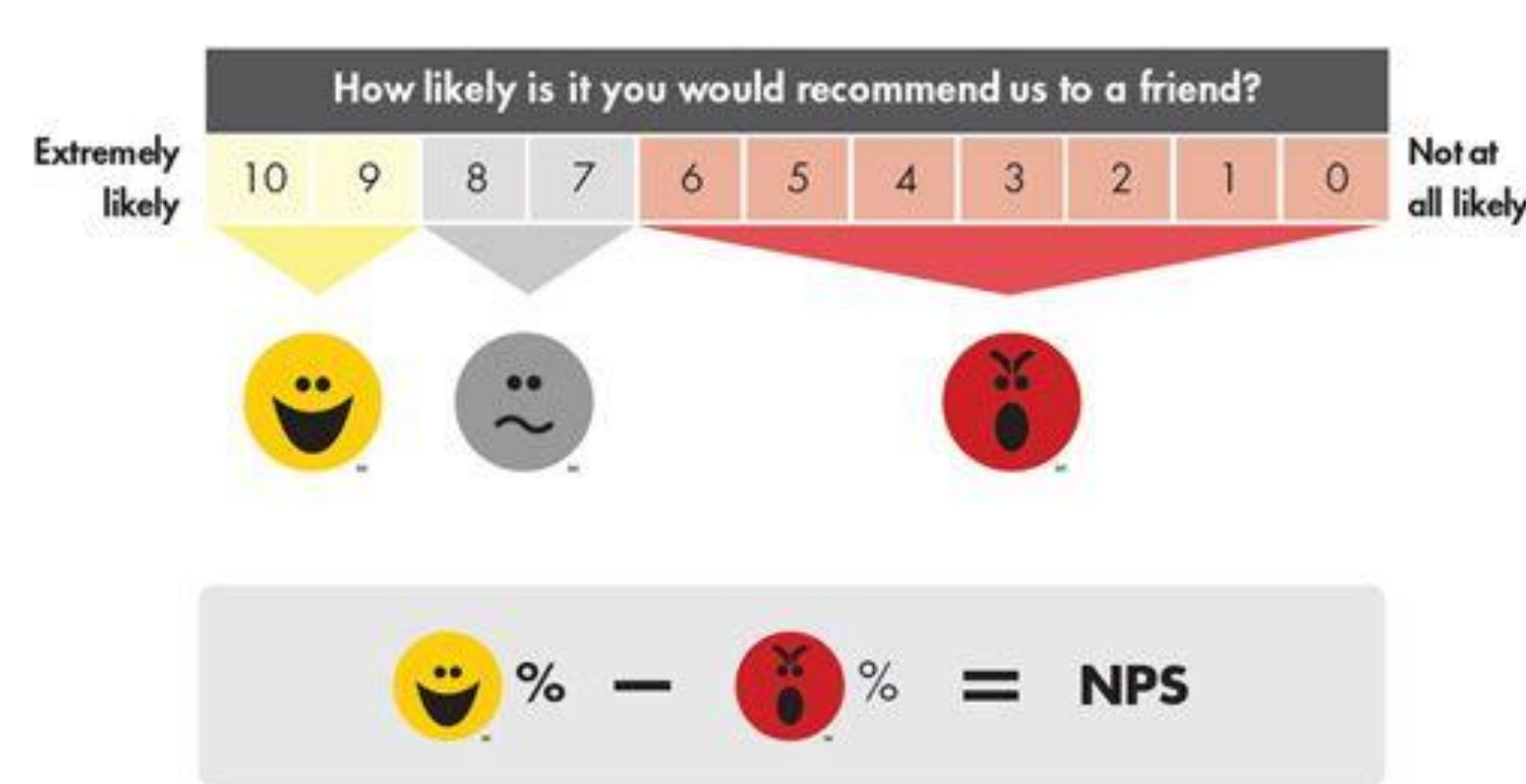
## User Friendly NPS-based Recommender System for driving Business Revenue

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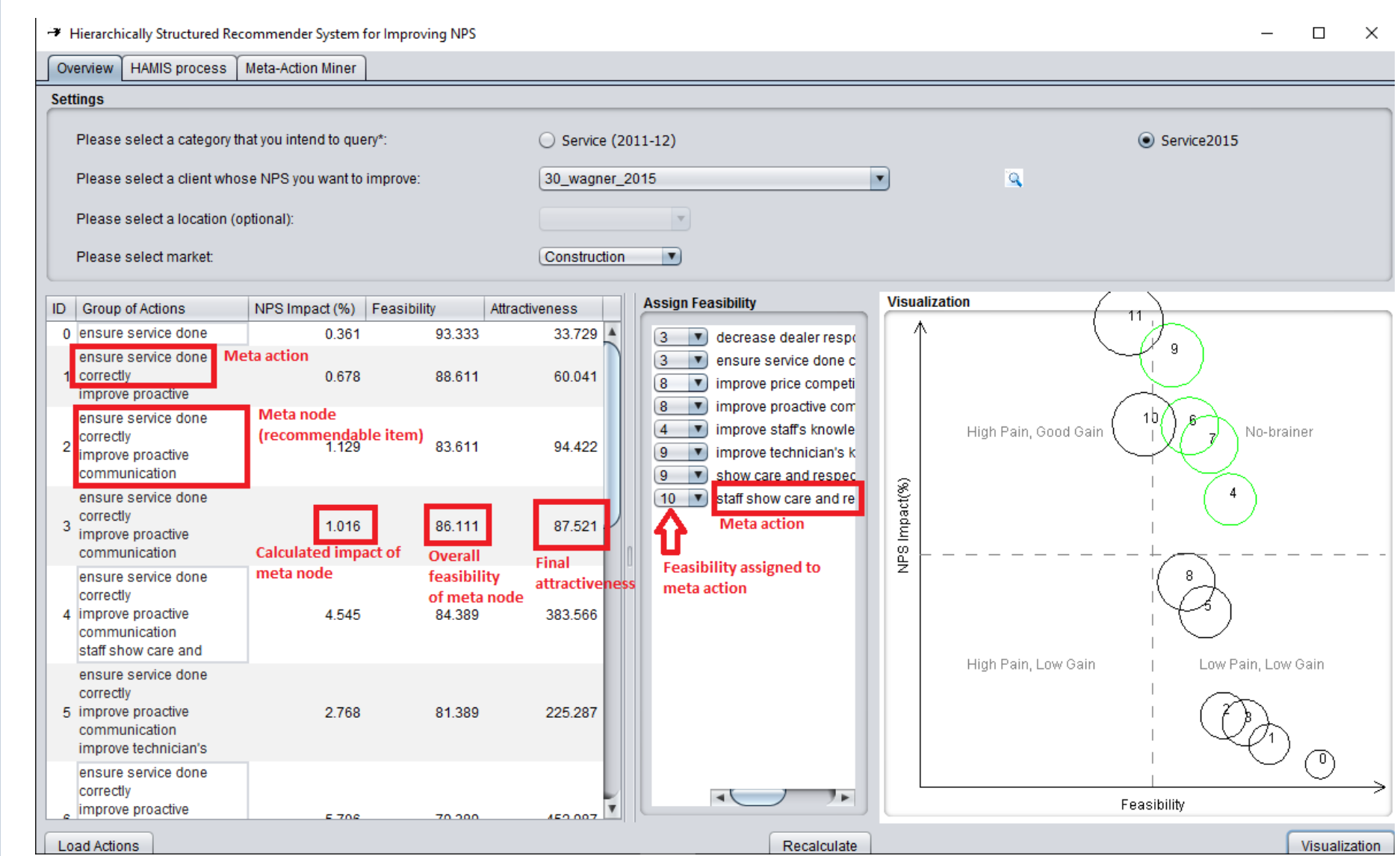
Data (2011-2016):  
Customer feedback:  
structured surveys +  
unstructured comments

### Net Promoter Score

**Promoters** are loyal enthusiasts who are buying from a company and recommend others to do so.  
**Passives** are satisfied but unenthusiastic customers who are open to offers from competitors.  
**Detractors** are the least loyal customers who may urge others to avoid that company.



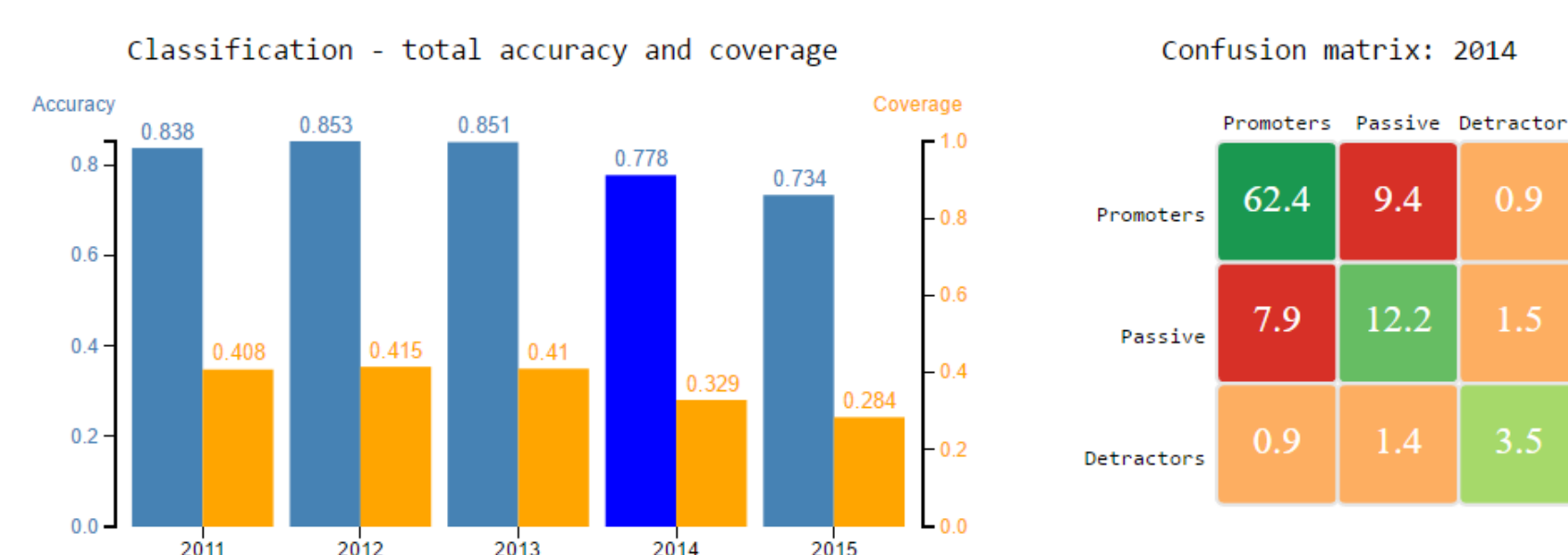
### Recommender System Engine (JAVA-based)



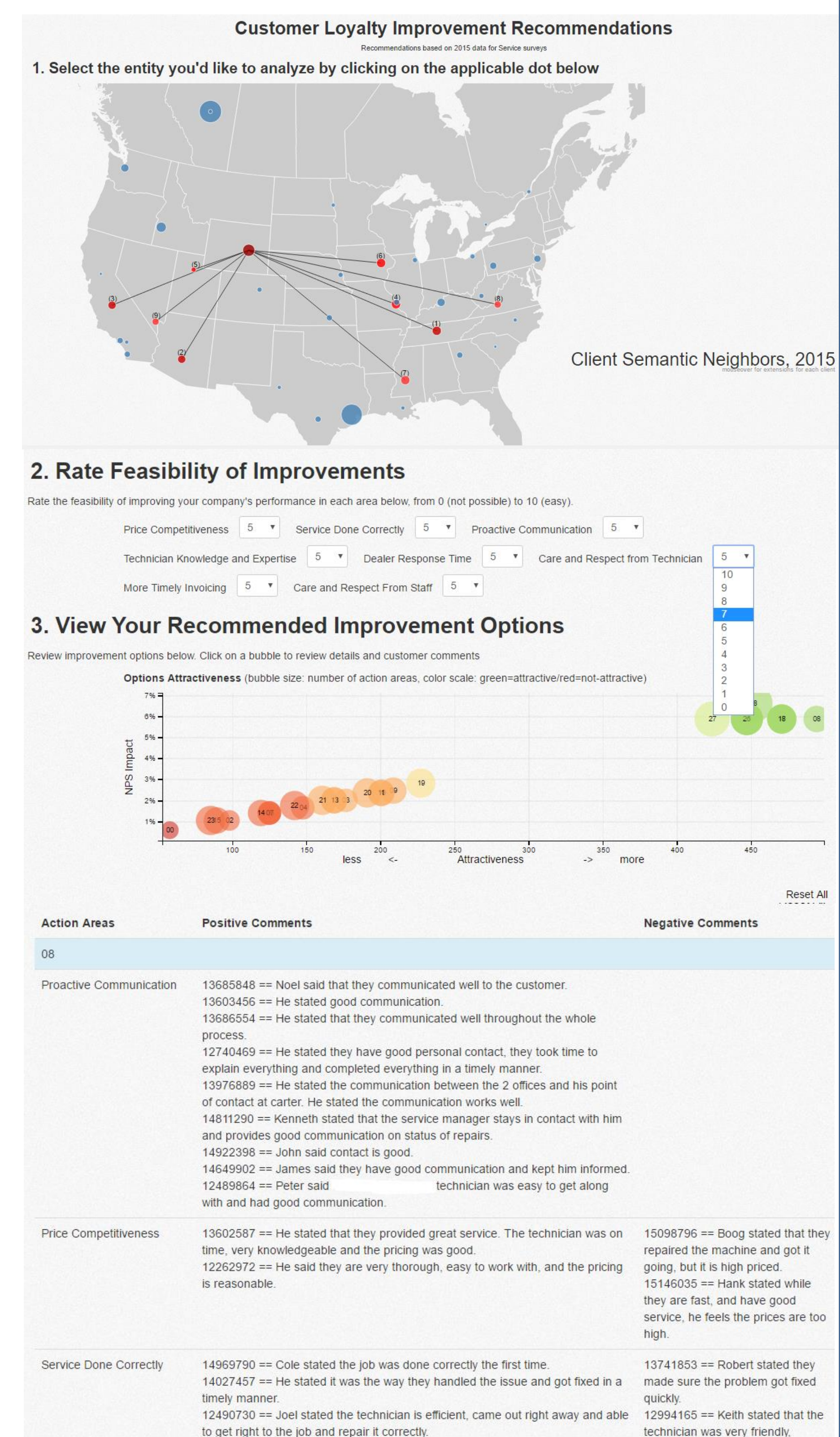
### Semantic similarity

Defined based on differences in  
confidence of corresponding  
**classification rules**

$$SemSim(C1, C2) = \frac{\sum_{k \in I_{Pr}} C1[1, Promoter, k] - C2[1, Promoter, k]}{card(I_{Pr})} + \frac{\sum_{k \in I_{Ps}} C1[1, Passive, k] - C2[1, Passive, k]}{card(I_{Ps})} + \frac{\sum_{k \in I_{Dr}} C1[1, Detractor, k] - C2[1, Detractor, k]}{card(I_{Dr})} + \frac{\sum_{k \in I_{Pr}} C2[2, Promoter, k] - C1[2, Promoter, k]}{card(I_{Pr})} + \frac{\sum_{k \in I_{Ps}} C2[2, Passive, k] - C1[2, Passive, k]}{card(I_{Ps})} + \frac{\sum_{k \in I_{Dr}} C2[2, Detractor, k] - C1[2, Detractor, k]}{card(I_{Dr})}$$

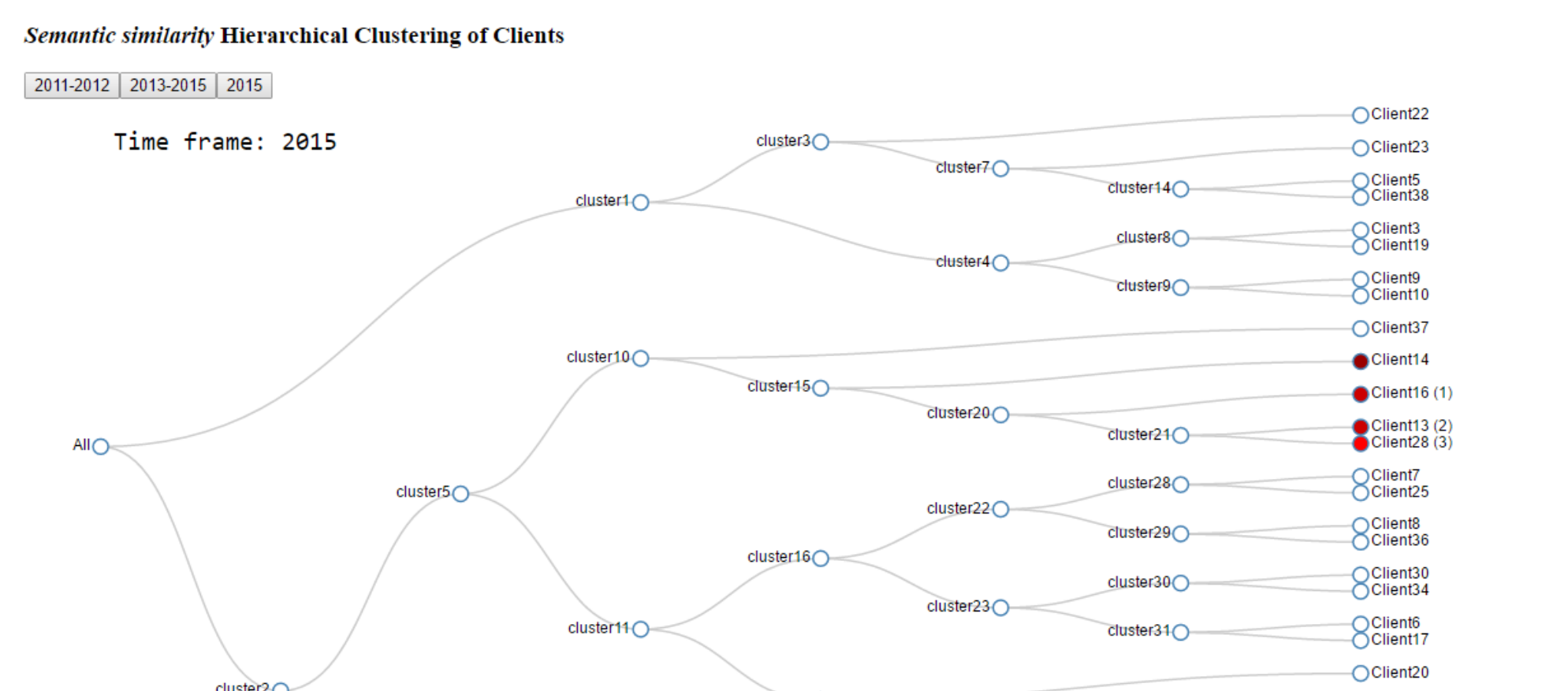


### Web Interactive Interface (Javascript-based)



### HAMIS – Hierarchical Agglomerative Method for Improving NPS

Based on hierarchical **clustering** algorithm



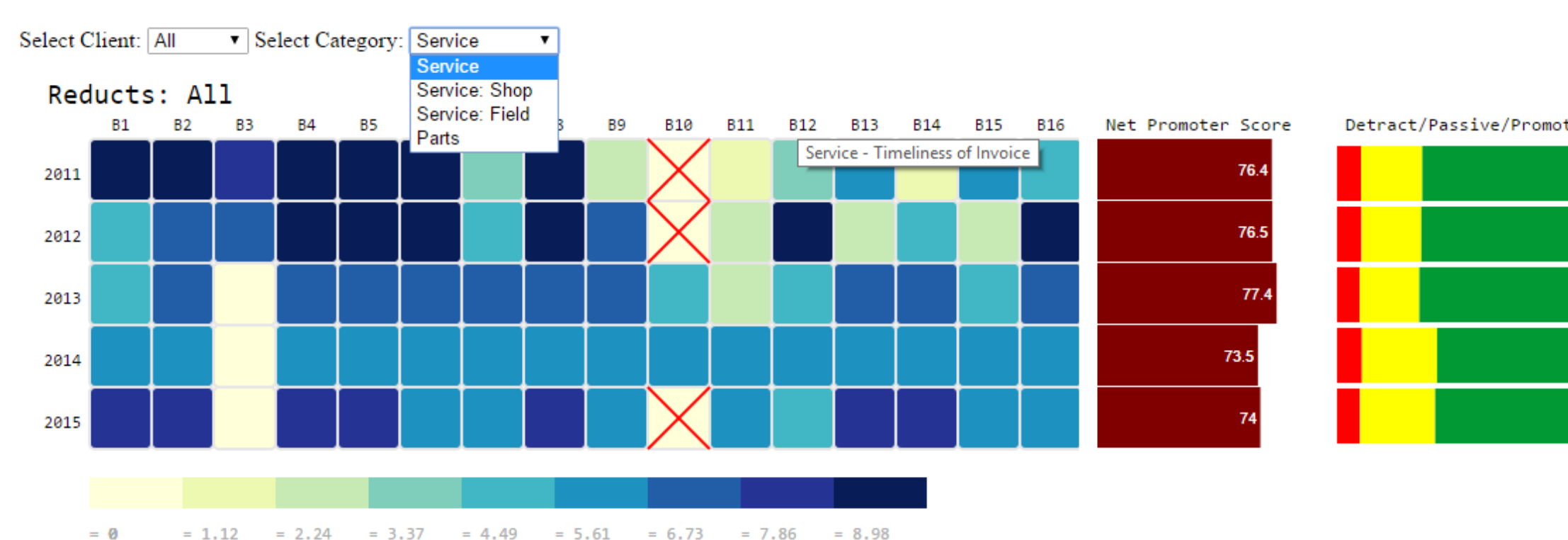
### Actionable knowledge mining

Action rule:

$[(\omega) \wedge (\alpha \rightarrow \beta) \Rightarrow (\phi \rightarrow \psi)]$  ((Benchmark: All Overall Satisfaction, (1->10))\*  
((Benchmark: All Dealer Communication, (1->5)))  
 $\phi$  – „Detractor”  $\Rightarrow$  (Detractor->Promoter) sup= 5.0, conf= 100.0

$\psi$  – „Promoter” ((Benchmark: Service-Repair Completed When Promised, (8->3))\*  
((Benchmark: All Dealer Communication, (1->10)))  
 $\Rightarrow$  (Detractor->Promoter) sup= 5.0, conf= 100.0

### Analysis of relevant benchmarks – feature selection



### Text mining

