

Experience of Combining QAW and Social Listening for Better Architecture

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Agenda

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- **Overview**
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Who am I?



- **Seung Ho Nam**

- **Program Manager @ VIP (Value Innovation Program) Center, Samsung Electronics**

- **What I do is...**

- introduce innovative software engineering practices to the organization
- manage various projects to help team build better software faster

- **Backgrounds**

- BS in Computer Science and Engineering from Seoul National University
- MS in Software Engineering from Carnegie Mellon University
- Served as a software engineer and consultant at Microsoft Korea for many years
- Delivered trainings and consultancies in Singapore, Thailand, and Saudi Arabia

Overview

● Why QAW?

- The QAW provides an opportunity to **gather stakeholders together to provide input about their needs and expectations** with respect to key quality attributes that are of particular concern to them. [Quality Attribute Workshops Technical Report, Third Edition, August 2003, SEI]

● Who is the most important stakeholders for Galaxy S5?

- Executives?
- Architects?
- Product Managers?
- Sales People?
- Developers?
- Testers?
- Other Engineers?
- ...
- Users (Consumers) ?



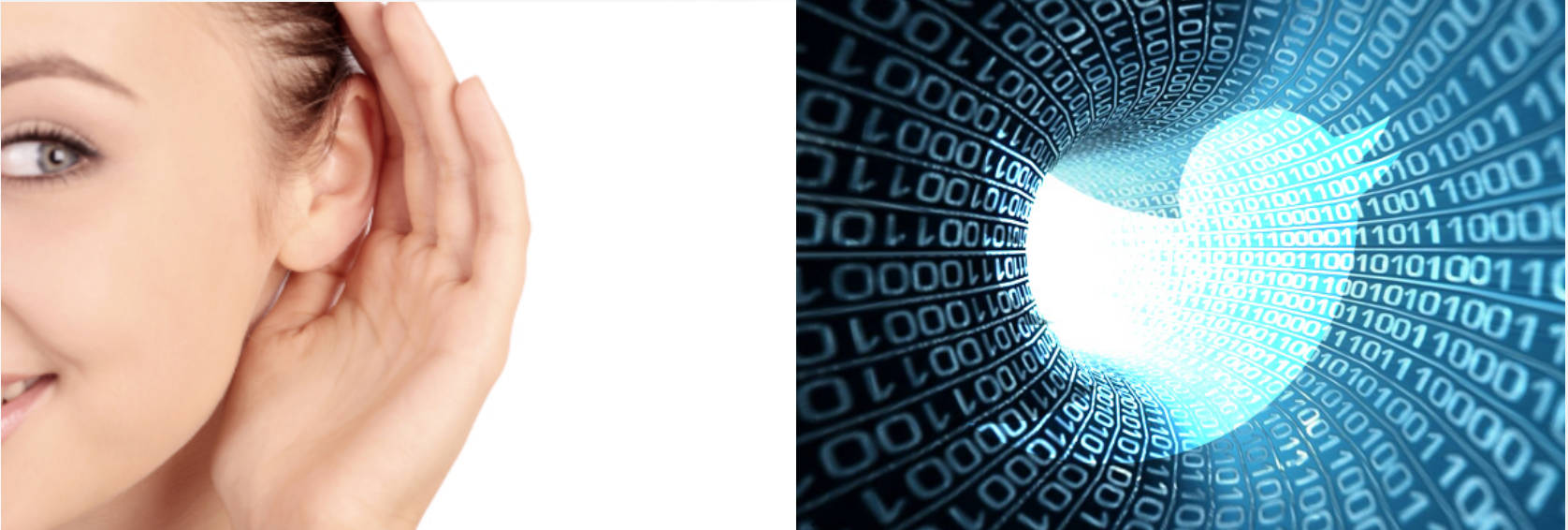
● Do you invite the users to your QAW's?

We do not invite consumers...

- **Even though we have done QAW's for about 10 years, we do not for following reasons.**
 - Security, Non-disclosure , Cost, Time, and so on.
- **To mitigate the risks, we do**
 - Consumer interviews (invitation based)
 - Home visit interviews
 - Surveys
 - Etc
- **Can we trust the results? Aren't they hiding something? Are the samples representative?**

However, we need consumers...

- **Can we hear consumers' voices through social network services?**



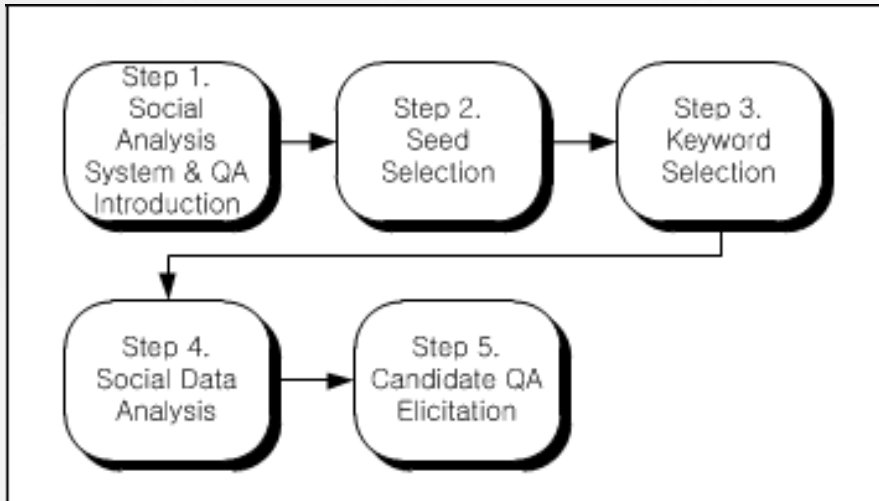
Our Approach

- **Bring consumers virtually to our QAW by**
 - 1) Modifying our QAW process to accommodate social listening**
 - 2) Collecting and analyzing social data with a system**

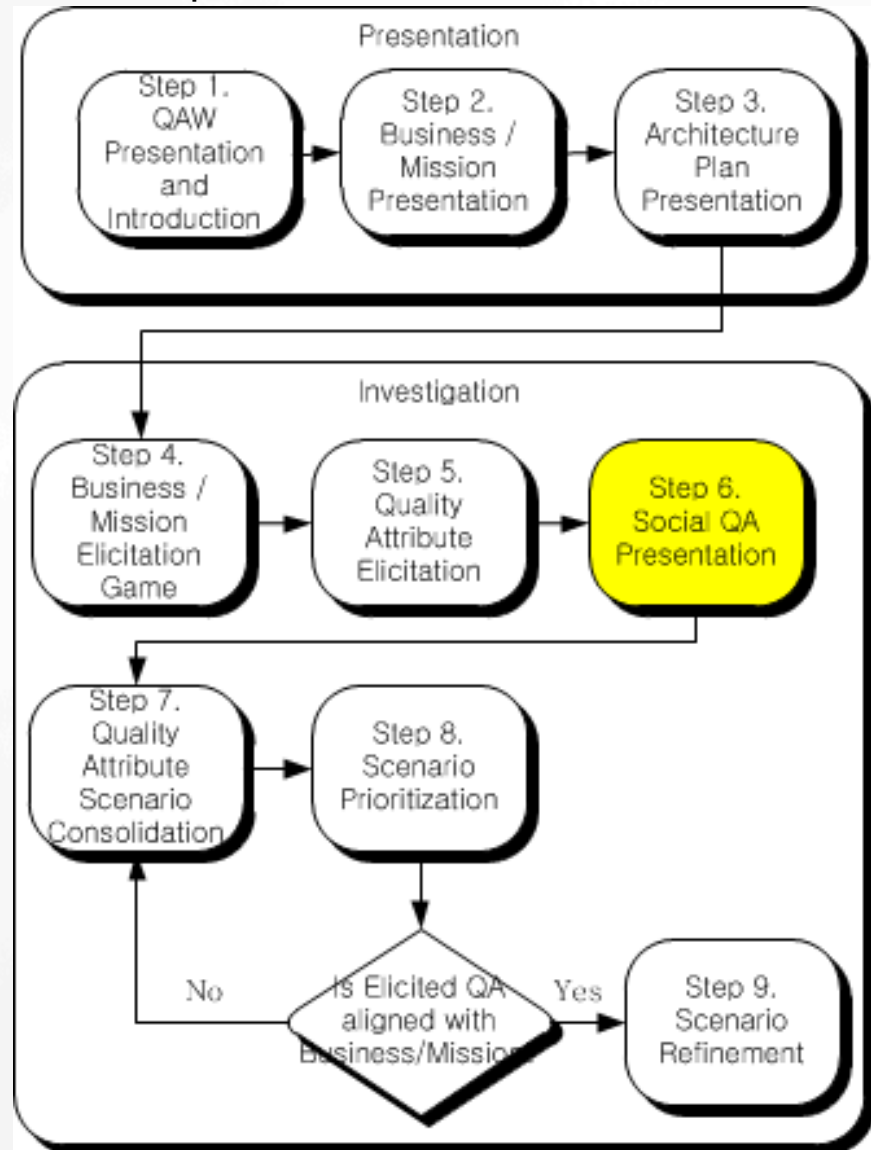


Our Approach – Process

Preparation Phase

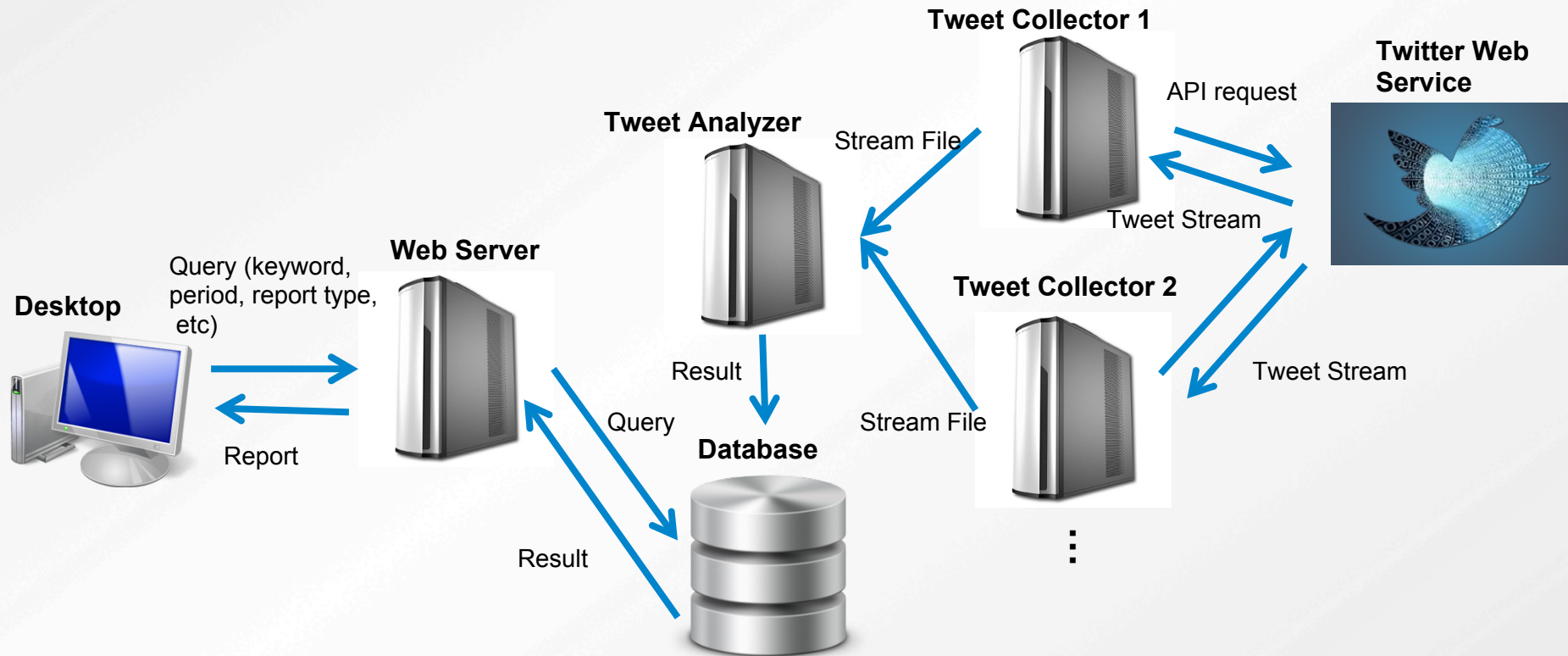


Workshop Phase

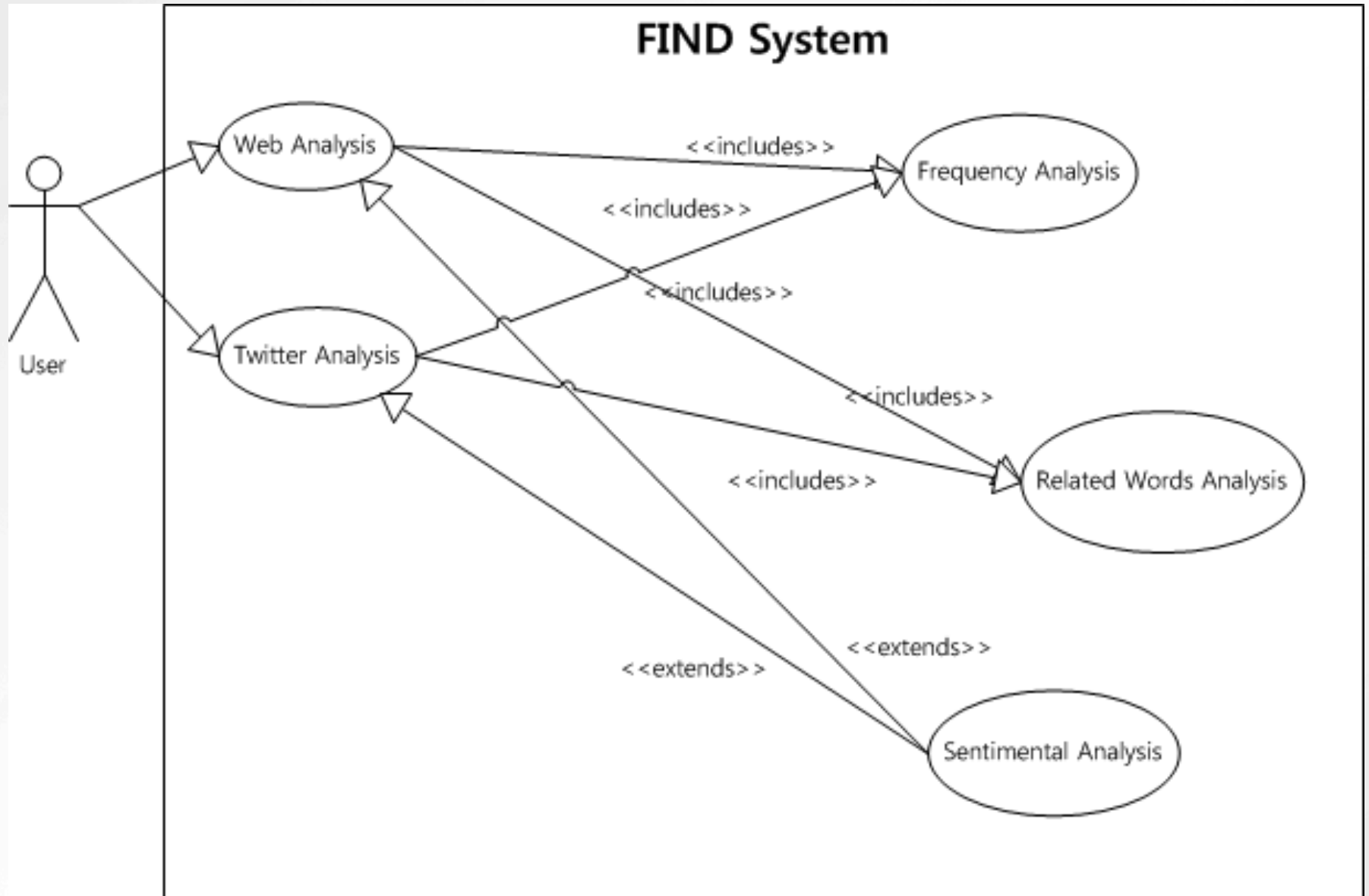


Our Approach – FIND System Context

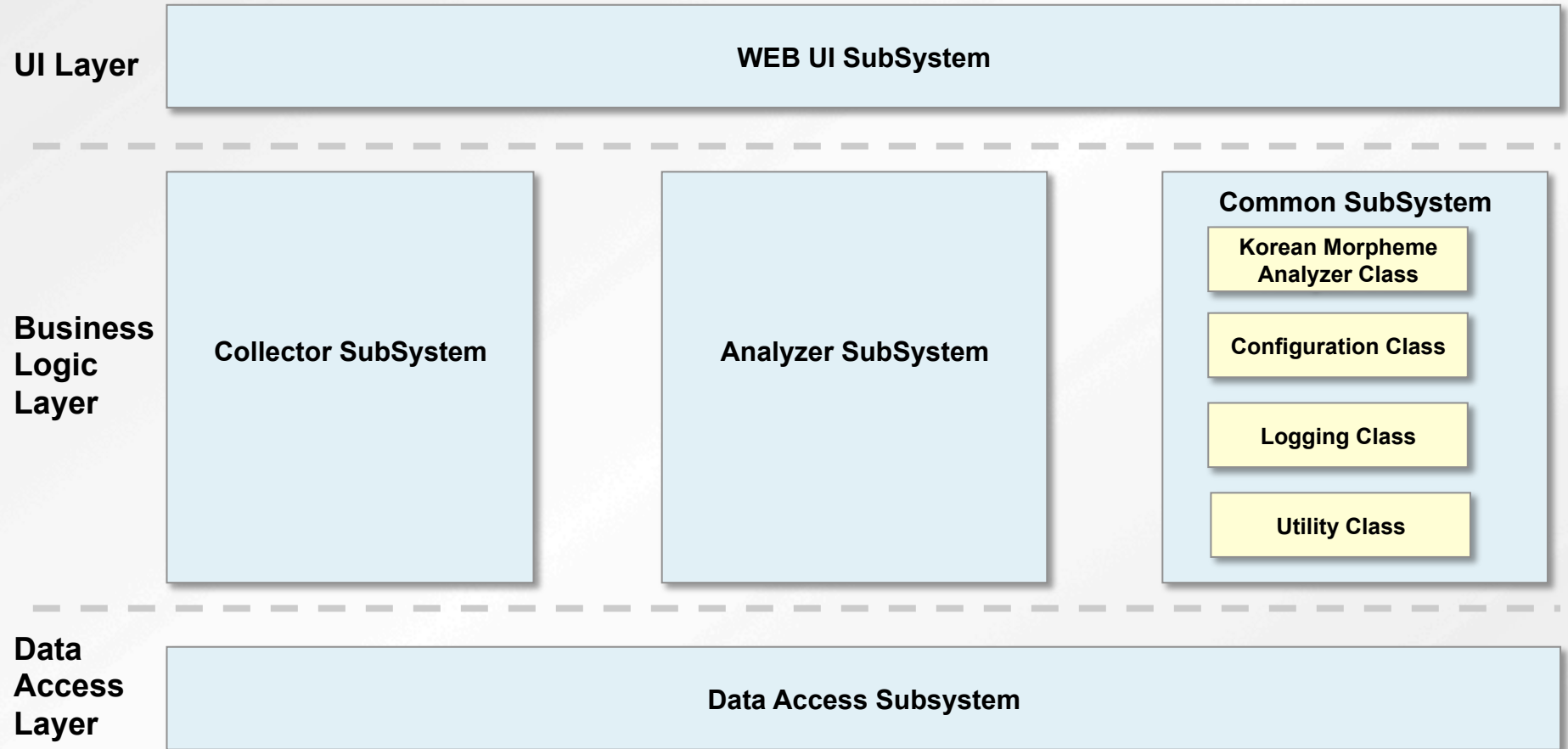
- **FIND (Find INSight by Data)**



FIND System – Use cases



FIND System – Architecture (Simplified Layered)



Application 1 – Experiment with Galaxy Gear

- **Problem:** We wanted to identify the QA's people talked about Galaxy Gear a few weeks after it was released. With this initial application, we also wanted to formalize our method based on the findings and outcome.
- **Our approach:** We followed our modified process to analyze Twitter data.
- **Assumptions we made:**
 - 1) The more tweets, the more people are interested.
 - 2) Twitter might be the best option we had.
 - 3) Sentimental analysis is quite reliable, even though it is not perfect.
 - 4) Other languages do not affect the result significantly.

Application 1 – Experiment with Galaxy Gear (cont.)

● **Step 1: Social Analysis and System & QA Introduction**

- Explain quality attribute (QA) and our social analysis system such as its purpose, working mechanism, and output to the team.

● **Step 2: Seed Selection**

- Choose the seeds as a team. (ex. a website's URL or an SNS).
- Activity: Identified 'Twitter' as the right seed for eliciting social QA's.
- Reason: Twitter has a myriad of real end users' voices with excellent API's.

● **Step 3: Keyword Selection**

- Discuss keywords for this QAW and select them as a team.
- Activity: Chose three product names around smart watch: 'galaxy gear' and 2 other smart watch products.
- Reason: The product is in its very early stage and there's no general noun like smartphone or specific technology term in fashion.

Application 1 – Experiment with Galaxy Gear (cont.)

● **Step 4: Social Data Analysis**

- Collect and analyze the data based on the chosen seeds and the keywords with the system for specific period of time (1~2 weeks).
- Activity: Collected tweets for 10 days and analyzed them in 3 ways:
 - 1) Keyword frequency analysis
 - 2) Related word analysis
 - 3) Sentimental analysis

● **Step 5: Candidate QA Elicitation**

- Elicit candidate QA's from the outcome of the social data analysis as a team.
- Activity: Elicited QA's as a team
 - 1) Choose some meaningful words from top words
 - 2) Search tweets with the keyword and related words
 - 3) Find the context
 - 4) Develop a QA based on the context

Application 1 – Experiment with Galaxy Gear (cont.)

- **Source: Twitter**
- **Collecting period: 2013. 11. 08 ~ 2013. 11. 18**

Keyword 1	“Galaxy Gear”
Top words	“note 3”, “phone”, “s4”
QA’s	Compatibility with other devices

Keyword 2	Another smart watch product
Top words	“men”, “women”, “sizes”, “iphone”, “bluetooth”
QA’s	Supportability for different display

Keyword 3	The other smart watch product
Top words	“basics”
QA’s	Reliability with basic functions

Application 2 – Eliciting Social QA's for Robot Vacuum

- **Problem:** We wanted to identify the QA's that people like to have on a new robot vacuum product.
- **Our approach:** We followed our modified process to analyze community data.
- **Step 1: Social Analysis System & QA Introduction**
- **Step 2: Seed Selection**
 - Activity: Chose an online community and Twitter as seeds
 - Reason: We wanted to hear both from actual users and the general public.
- **Step 3: Keyword Selection**
 - Activity: Chose three keywords (navibot and 2 other robot vacuum products) for an online community and three keywords (로봇청소기, navibot, and another robot vacuum product) for Twitter.
 - Reason: We wanted to compare each product's user feedback and extend to Korean feedback.
- **Step 4: Social Data Analysis**
- **Step 5: Candidate QA Elicitation**

Application 2 – Eliciting Social QA's for Robot Vacuum (cont.)

- **Source: An online community**
- **Collecting Period: Jan. 1, 2014 ~ Apr. 8, 2014**

Keyword 1	“Navibot (Smart Tango)”
Top words	Dead
QA's	Reliability with the operation / Usability with error information
Keyword 2	Another robot vacuum product
Top words	Right, Wheel, Resistance
QA's	Reliability with wheel / Usability with error information
Keyword 3	The other robot vacuum product
Top words	Problem
QA's	Reliability with homing to docking station

Application 2 – Eliciting Social QA's for Robot Vacuum (cont.)

- **Source: Twitter**
- **Collecting Period: Dec. 23, 2013 ~ Mar. 28, 2014**

Keyword 1	“로봇청소기” (“Robot Vacuum”)
Top words	물걸레 (wet mopping), 마르지 않는 (not dried out)
QA's	Extensibility with driving patterns of multiple cleaning tools

Keyword 2	“Navibot”
Top words	Charger
QA's	Reliability with charger and battery information

Keyword 3	The other robot vacuum product
Top words	Battery
QA's	Performance of battery management and power consumption

Lessons Learned

- **Preparation phase was applicable.**
- **Positive points and negative points could made us more assured.**
- **We could figure out which QA people are more interested in based on an objective supporting data.**
- **Social QA's complemented QA's from people's workshop.**
- **This approach was time-and-cost-efficient.**
- **Twitter might not be accurate because it gives time-specific data.**
- **We are not in the stage to tell if a social QA is really beneficial for a real product.**

Future Work

- **Context based analysis (grouping words in similar meanings)**
- **More advanced sentimental analysis**
- **Social QA elicitation technique process and automation**
- **A tool for filtering out what not to believe**
- **How to handle Twitter-specific characteristics**
 - Advertisement
 - Small number of tweets on a topic
 - Retweets
 - Twitter API's reliability
- **Applying human psychological analysis technique (catching meanings behind metaphor, sarcasm, irony, and so on)**
- **Support more languages**

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Q&A

Thank you.