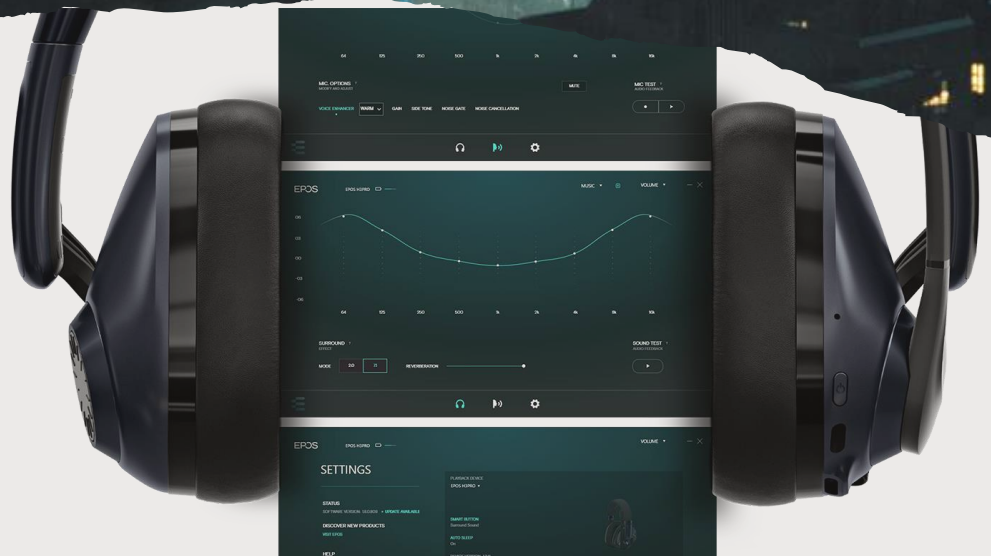
Distributed Noise Monitoring

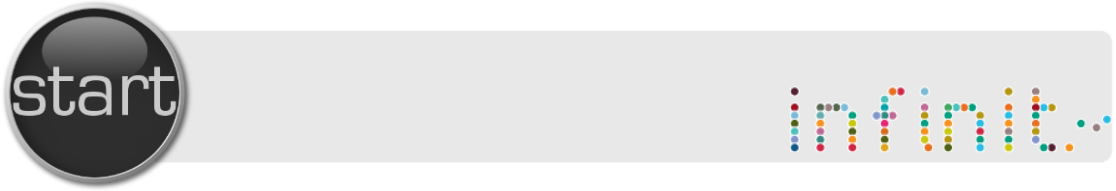
A Design Journey

Disclaimer



Research Project - Sensors in a Network

Microphone
Accelerometer
Gyroscope
Movement
Humidity
Temperature
Light
GPS
Etc…



OBJECTIVE

“The objective of the project is to explore the possibilities in a distributed system aimed at monitoring noise in a bounded space, and to visualize the measured data in a fashion that is relevant to the given context”

The project will be run as a prototype project, with the main focus on the functionality.

Focus Area of Project

Open Office Environments

- Knowledge Workers
- Call Centres

(Interaction) Design Approach

Design Approach 101

- Desktop Research
- Identifying Needs
- Develop Alternative Proposals
- Building Interactive Prototypes
- Evaluate throughout the process

Cases

- Interview with a Bank
  - Security Department; Ranging from large open office areas down to open spaces between with 25-80 employees
    - Cubicles & Open Spaces
    - Primarily knowledge workers
- Interviews with IBC –
  - Course Centre with ca. 500 employees
    - HTX, Master Degrees, Conferences
    - One Big Open Space for all; kitchen personnel, office workers to front desk

Central Statements

- Confrontations between employees due to noisy behaviour
- A noise map of the noise during the day
- Objective measurements are better than subjective
- To be able to visualize noise data
- To see if I annoy my surroundings by speaking too loud
- Find a quiet corner for an important conversation
- Long Time Monitoring
- A picture of the noise “here & now”
- Use data to place people with the similar behaviour and needs close
- Alter peoples (noisy) behaviour

2 Different Needs

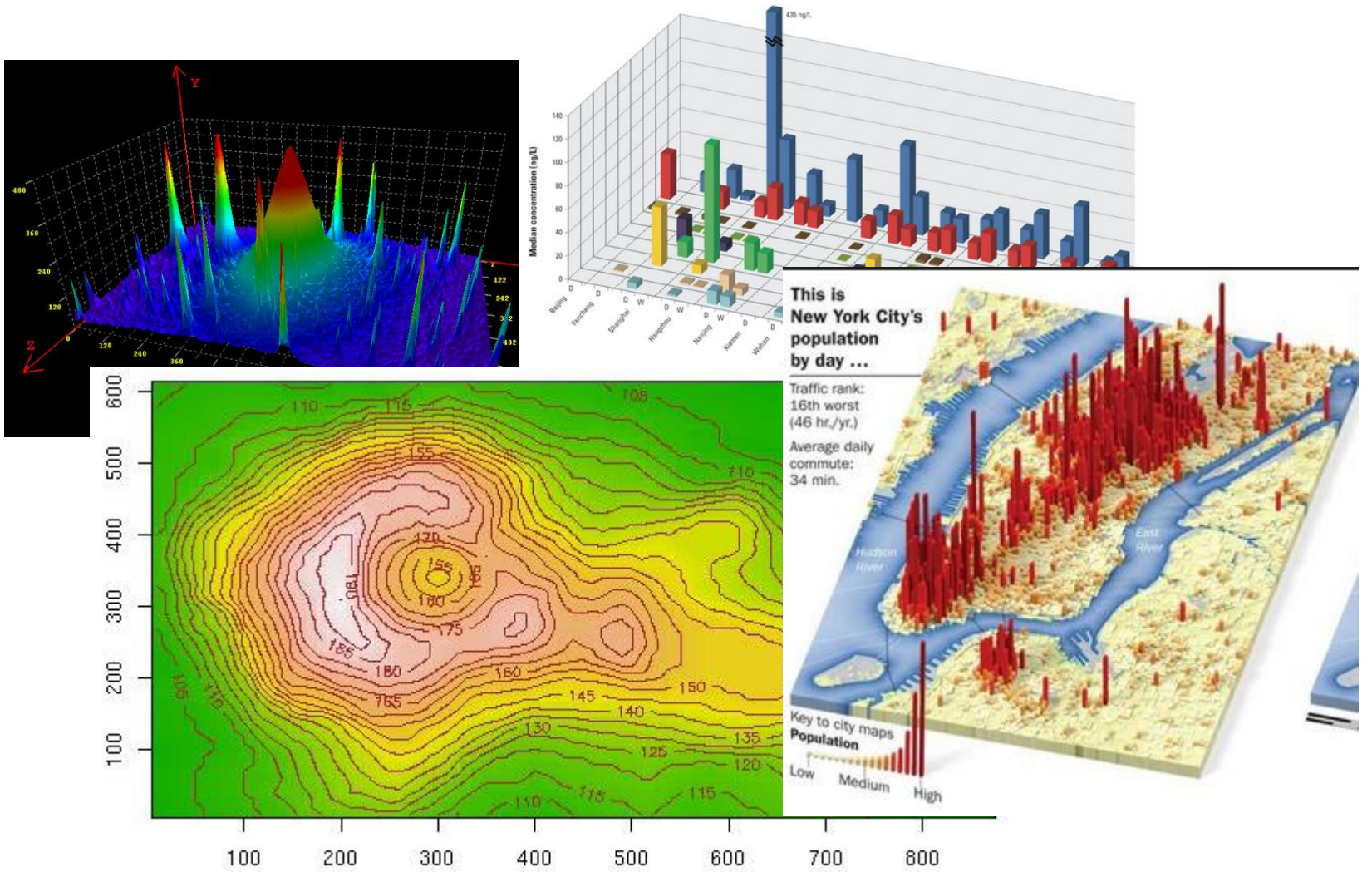
- Administrative Need – employee planning, moving people, work environment and employee satisfaction : **Collecting data**.

- Individual – change behaviour, nudging, find a quiet area, ”am I disturbing my surroundings?”, “I can’t concentrate”: **Behaviour**

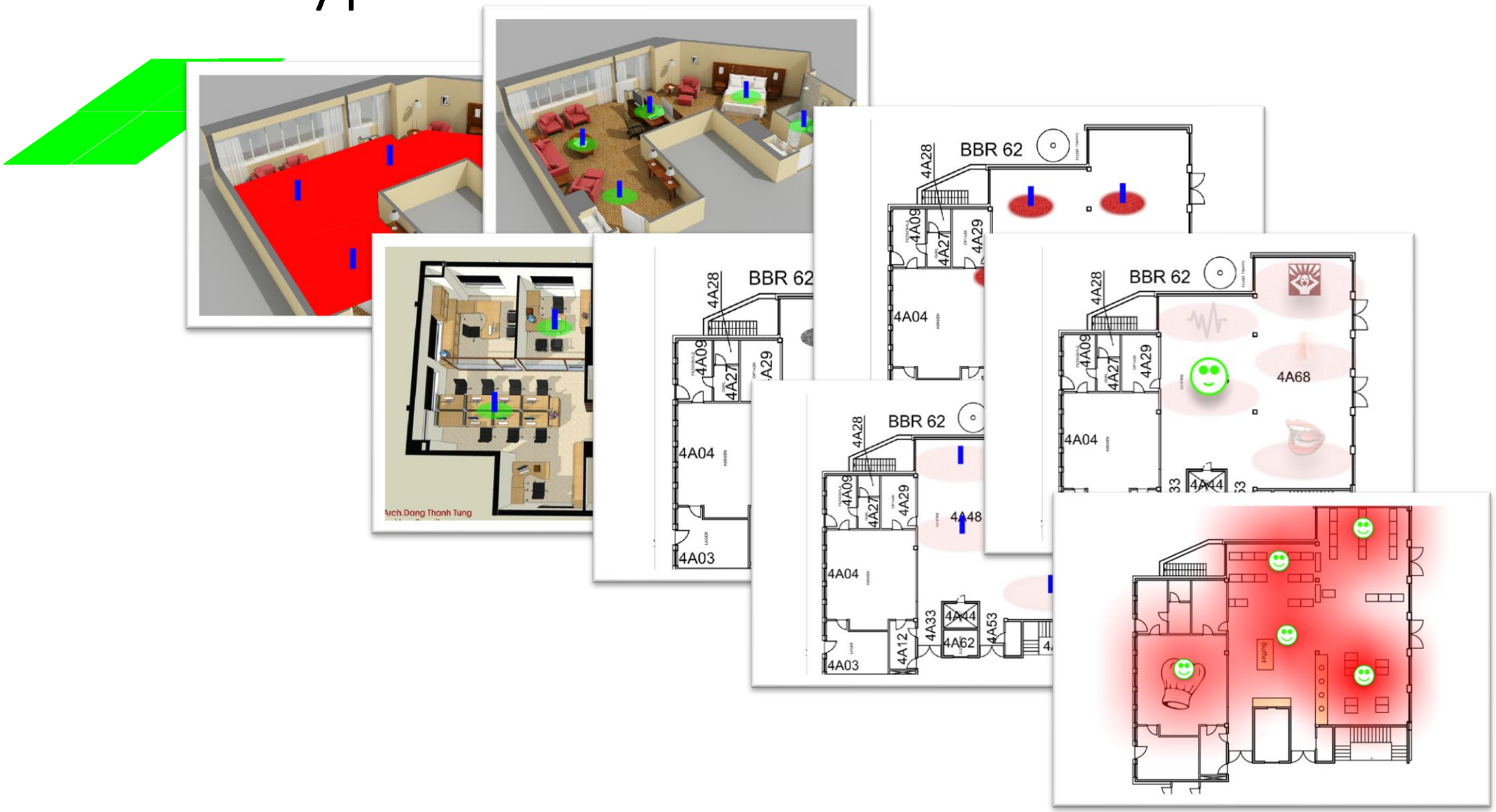
Prototype Choice

- To rely on existing sound level meters from SoundEar for the data collection
- Focus on different ways to visualize data & building a prototype

Visualization



Prototype Sketches



Prototype

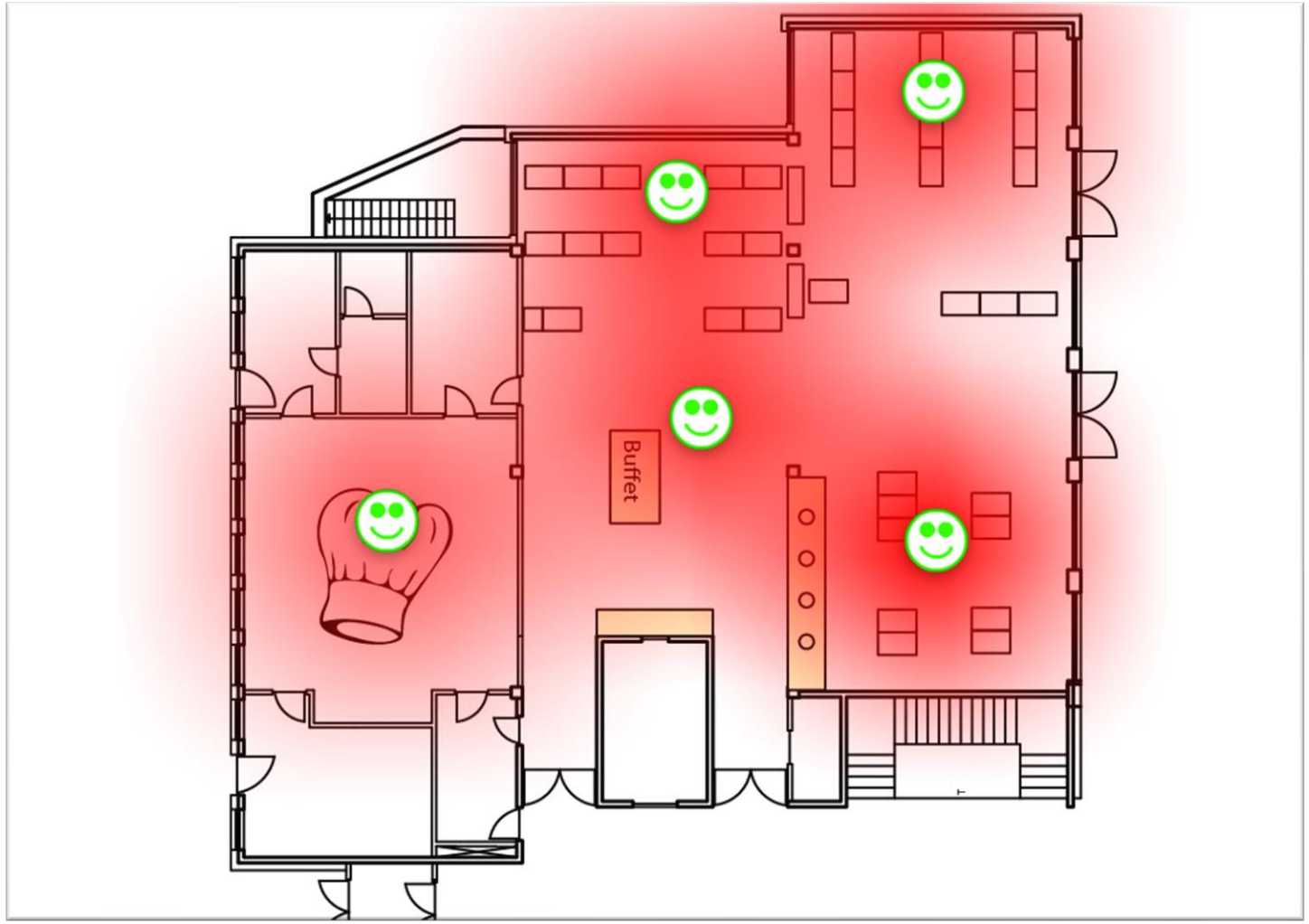
2 Screens

10 Sensors

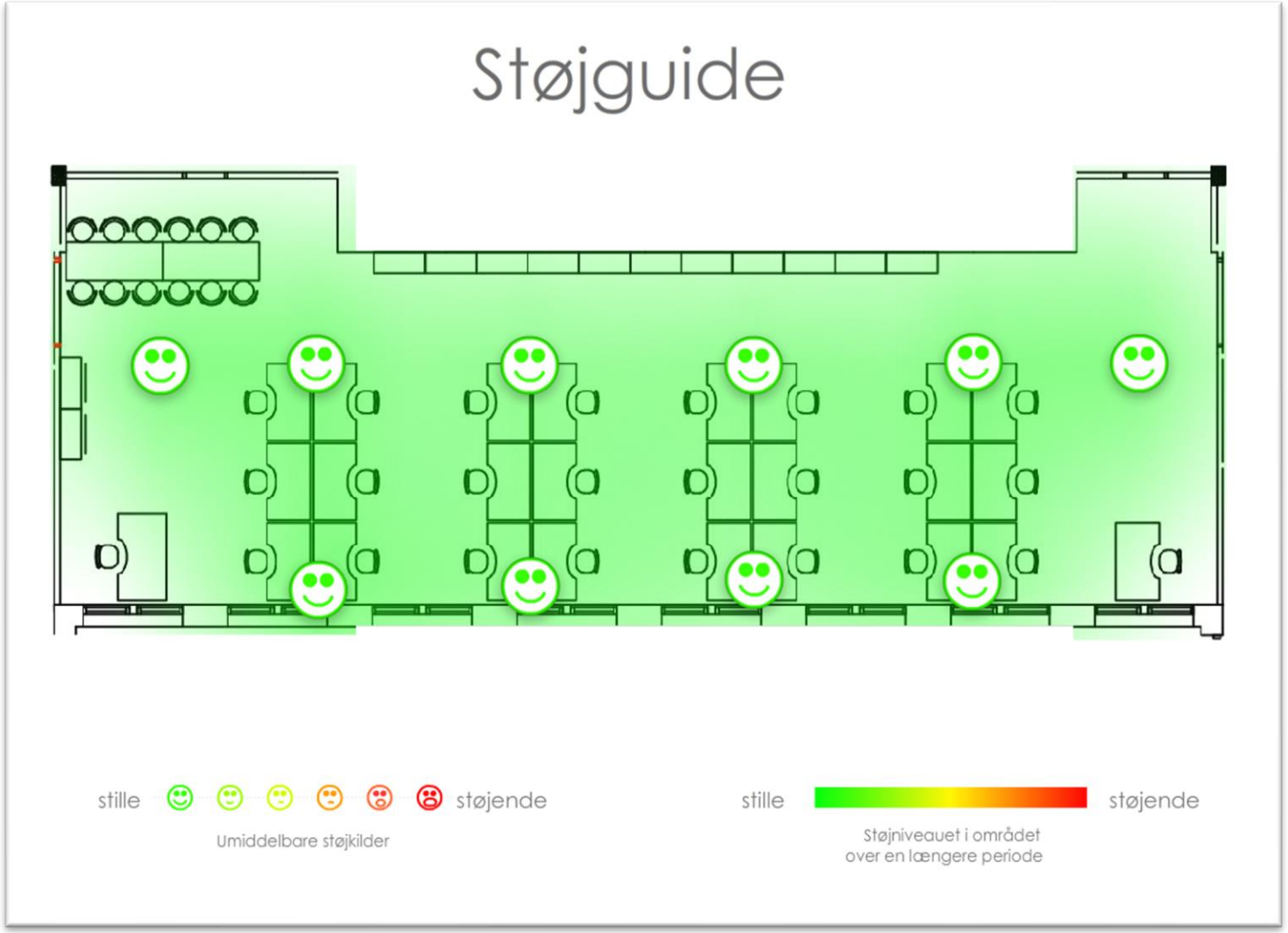
1 Laptop

Test Run 1@Delta

Test Run 2 @ Jabra



Prototype Test at a Danish bank
2 different locations



Test Location & Setting Up

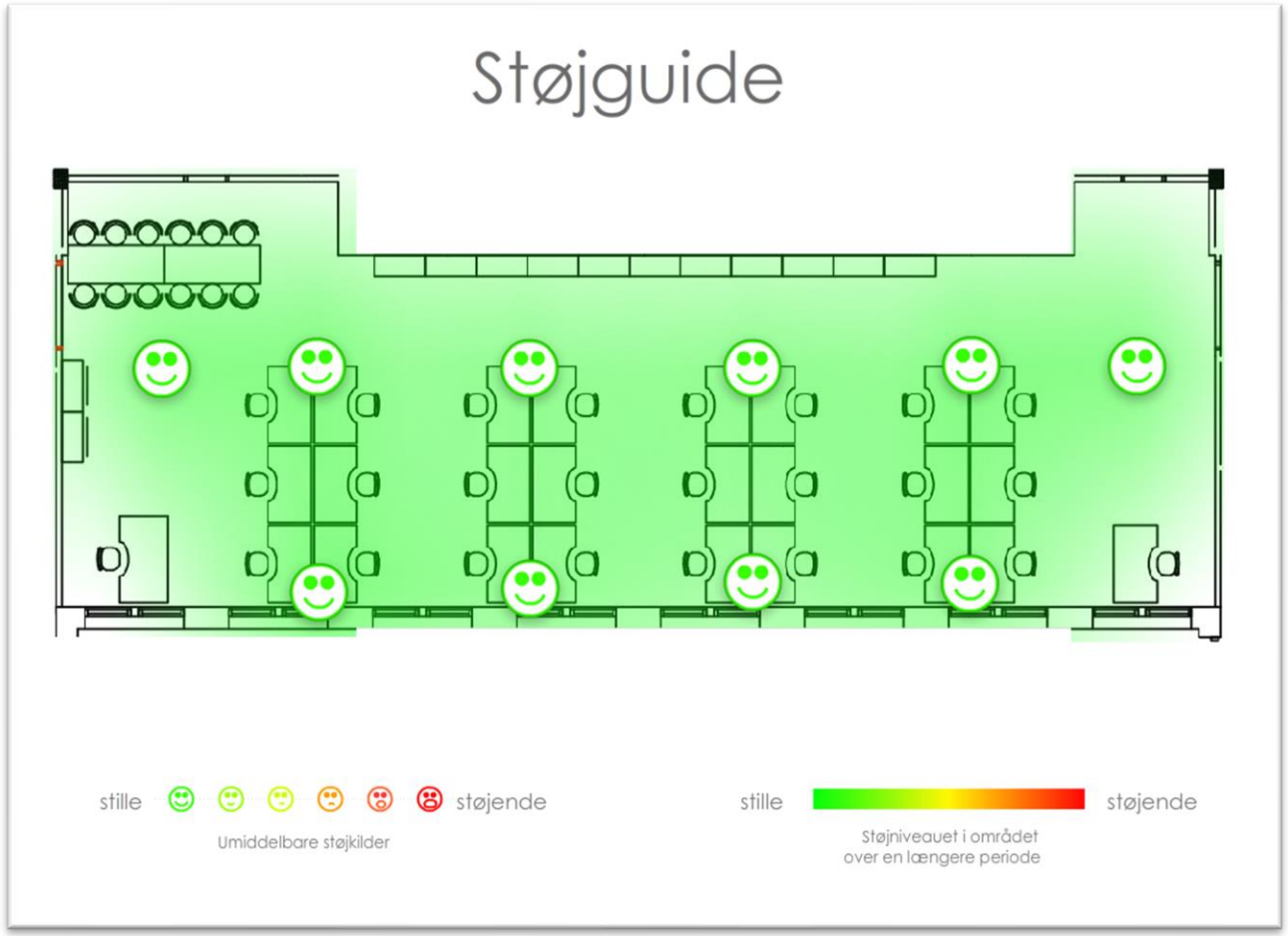
Test Period

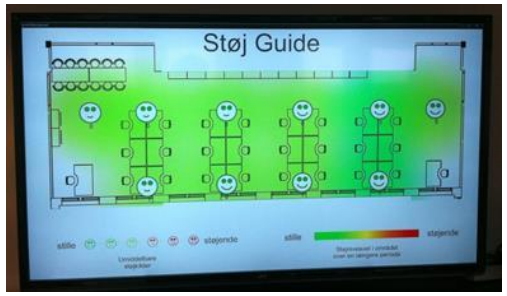
- During the test period (1 month) we visited every day in the beginning, and then once a week to get feedback, and make minor adjustments from feedback

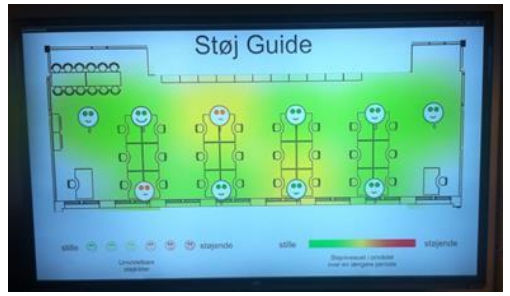
- 2 Whole days of observation

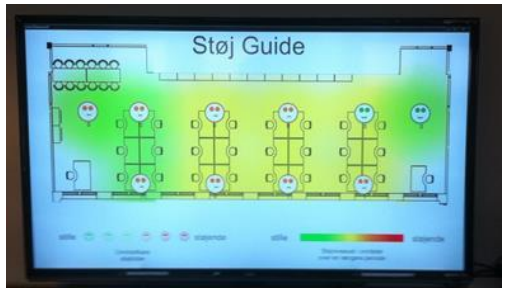
- Questionary

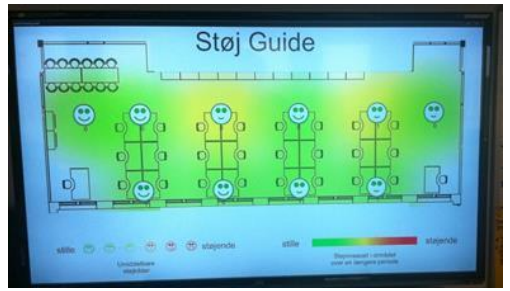
Prototype ‘a Danish Bank’

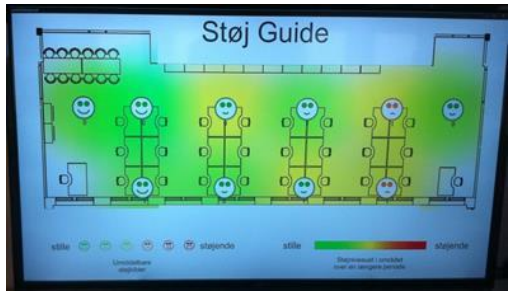


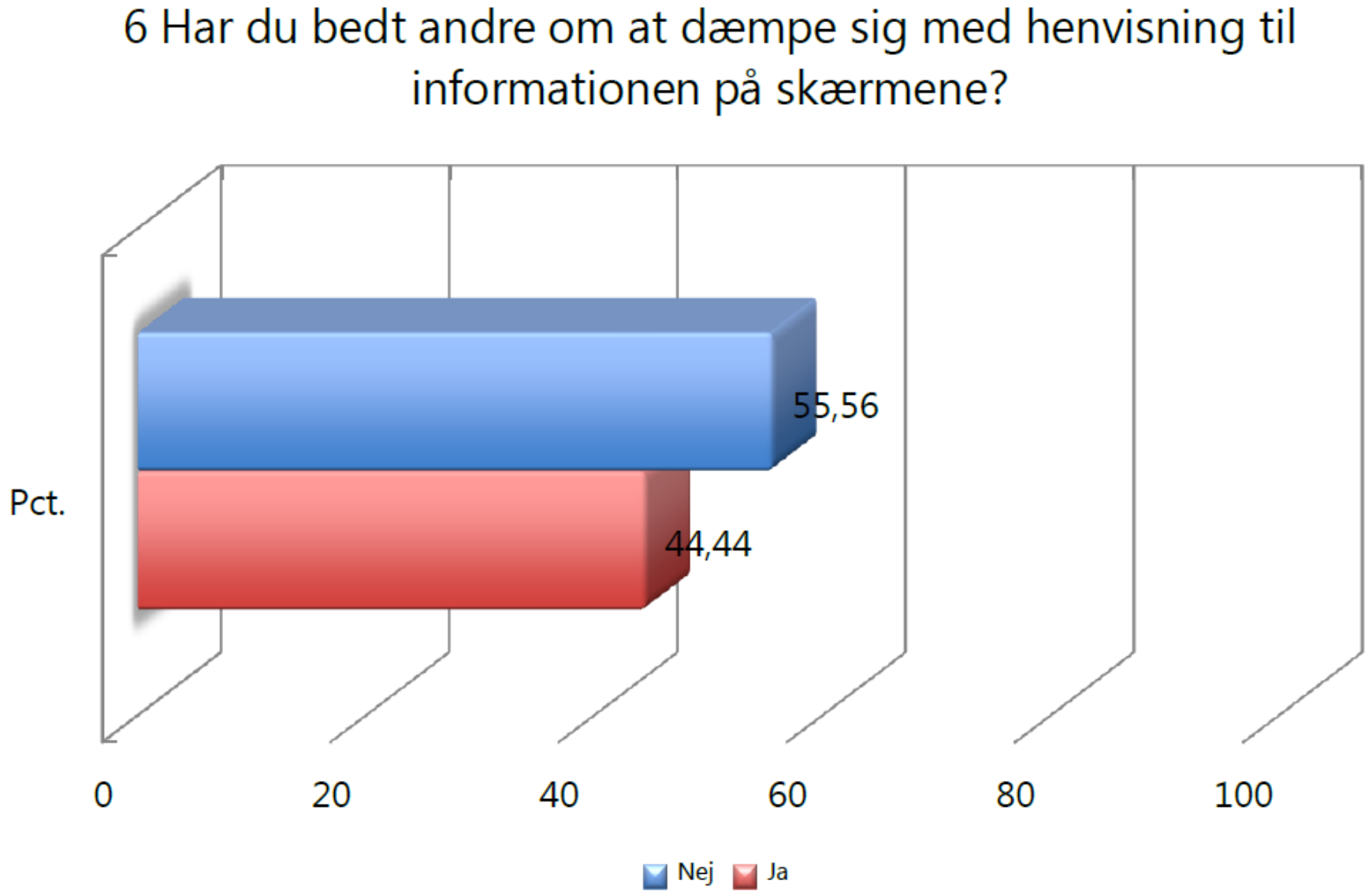




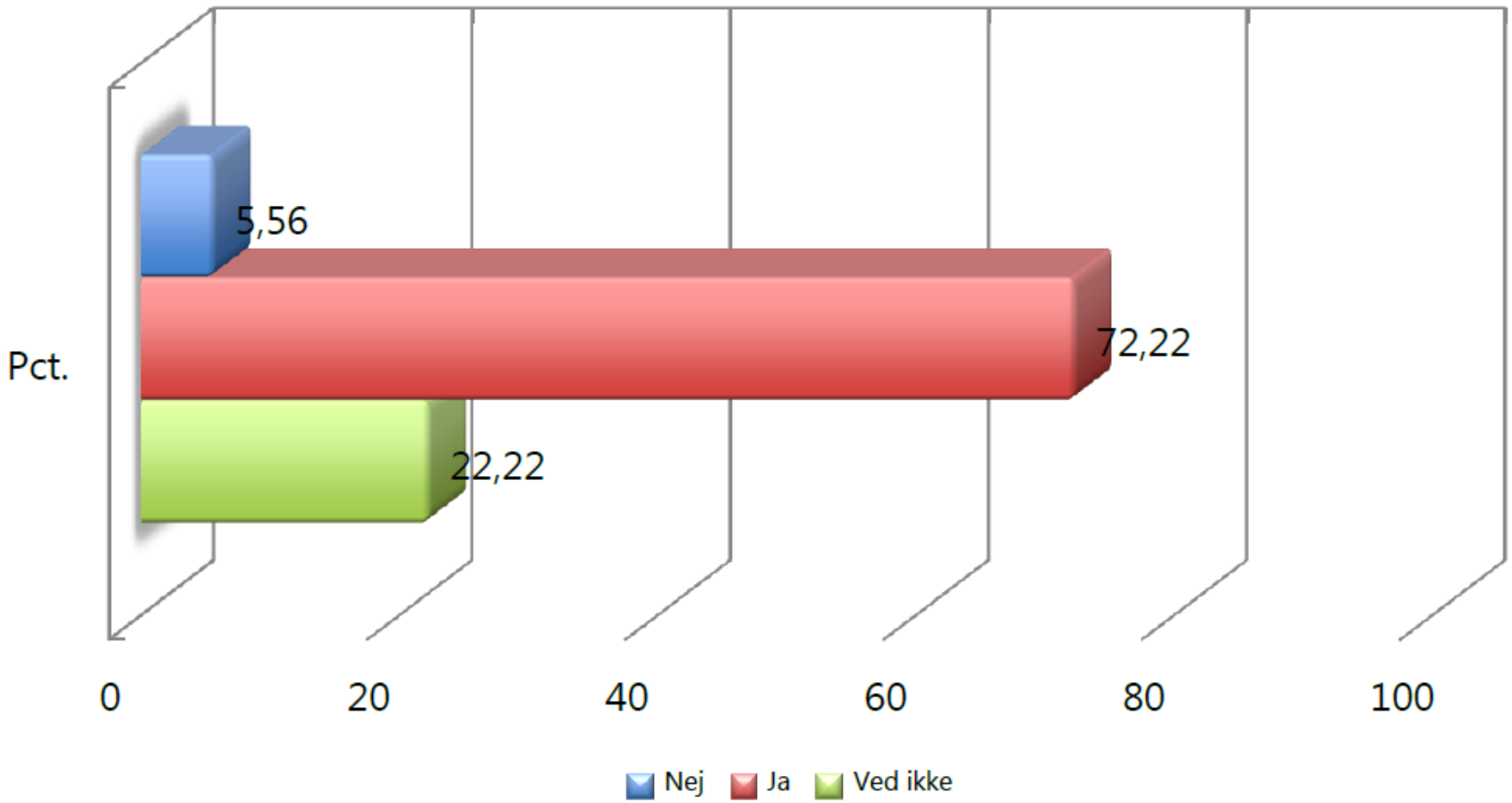







6 Har du bedt andre om at dæmpe sig med henvisning til informationen på skærmene?
Pct.
55,56
44,44
0
20
40
60
80
100
Nej
Ja

8 Vurderer du at der områder i lokalet der er mere støjende andre områder?



Research Project Findings

SoundEar, Jabra & Delta conducted a research project,

investigating using sensors to improve noise in open office environments

Visualisierung von Lärm in offenen Büroräumen beeinflusst das Verhalten der Mitarbeiter und verringert Lärmbelästigungen

Findings : So Many Ideas……

Mass-deployment of settings to several devices from a central hub/point:

Differentiate between speech/babble noise and other noise sources

Have Different Routines Limits:"Concentrate Thursdays", Quiet Hour from 15-16

Data Collection: Group people by behavior rather than function.

Data Collection: And Visualization for Employees

Identify noise type and noise sources:

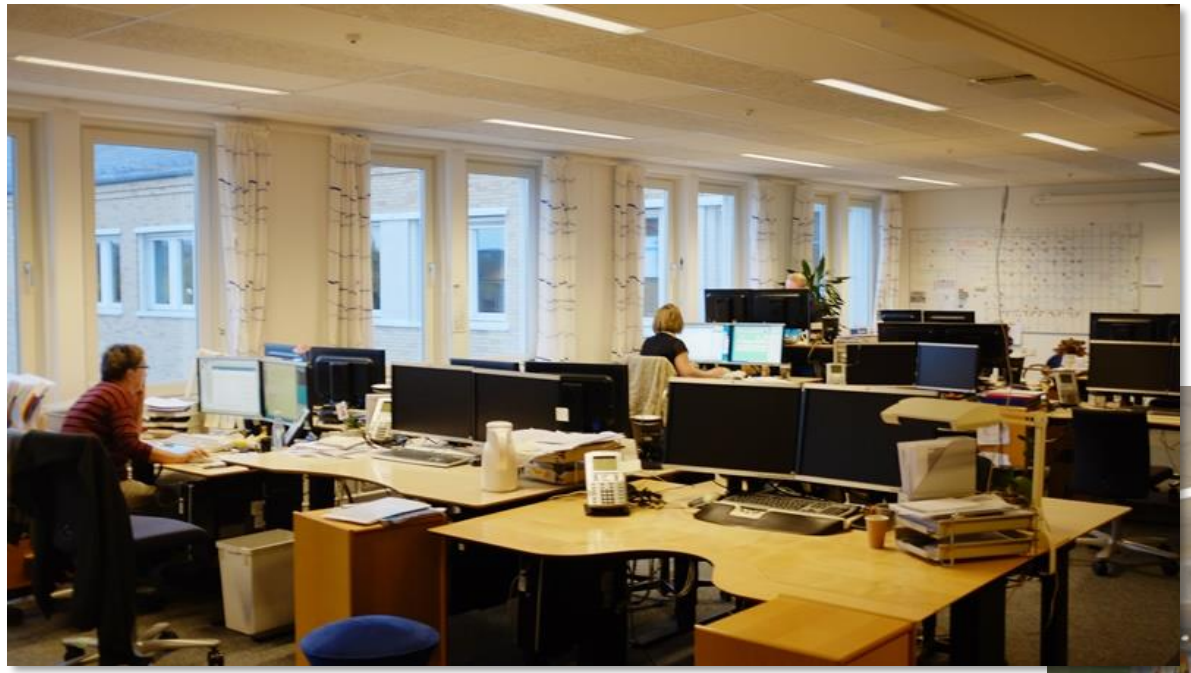
By analyzing the data from several devices in a location, and categorizing the noise, it is possible to determine the types of noise that have been present in the open space, and the approximate location of the different noise sources using triangulations (would require GPS location & more advanced noise measurements FFT spectrum or similar):

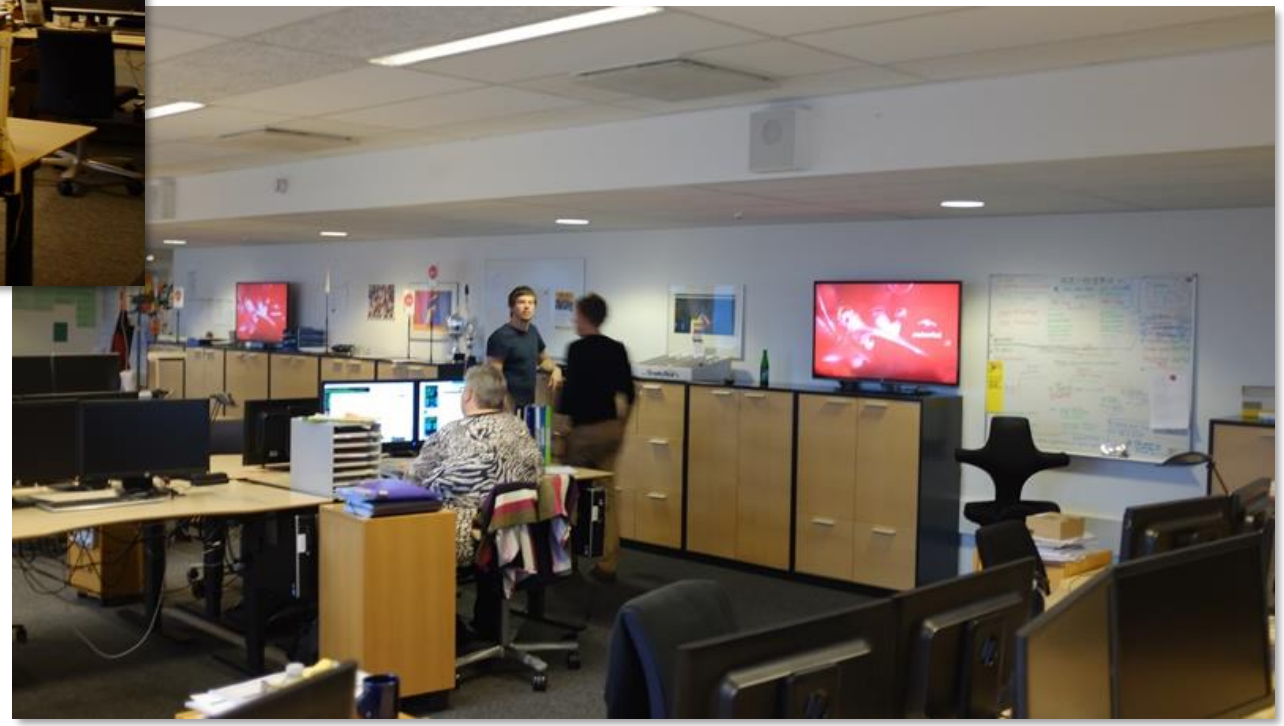
- Noisy persons/groups (Speech/babble noise)
- Noise from air conditioning
- Noisy hardware (keyboards, printers, telephones (ringtone)
- People walking by (footsteps, etc.)
- Doors slamming
- Etc…

We could take advantage of the fact that…

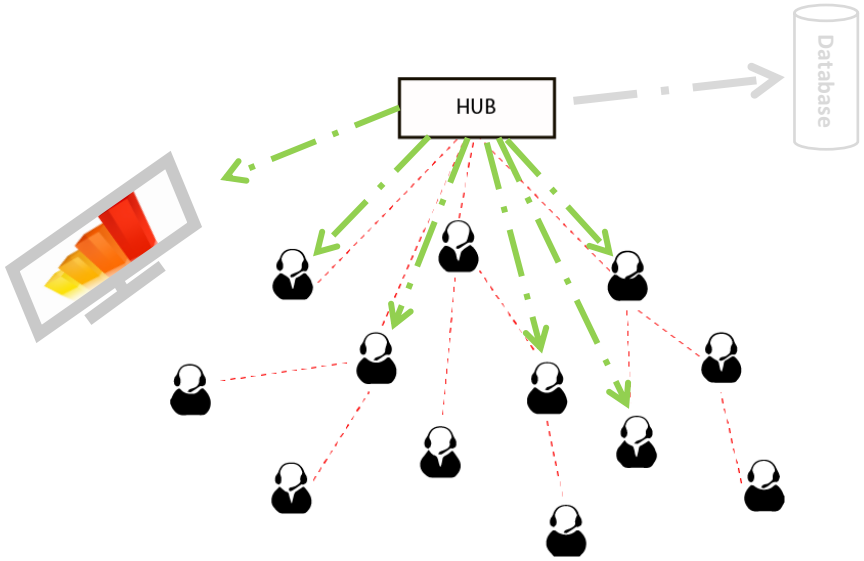
- Office headsets could also work as sensors in a network with the visualization “ears”
- Could be an add on service
- Data could be gathered from individual headset

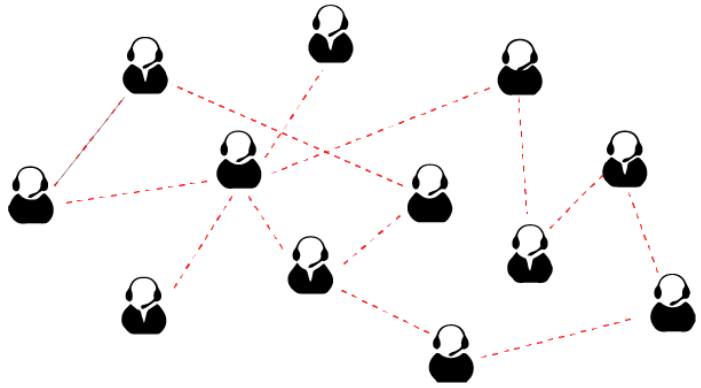
Findings : One Major Problem



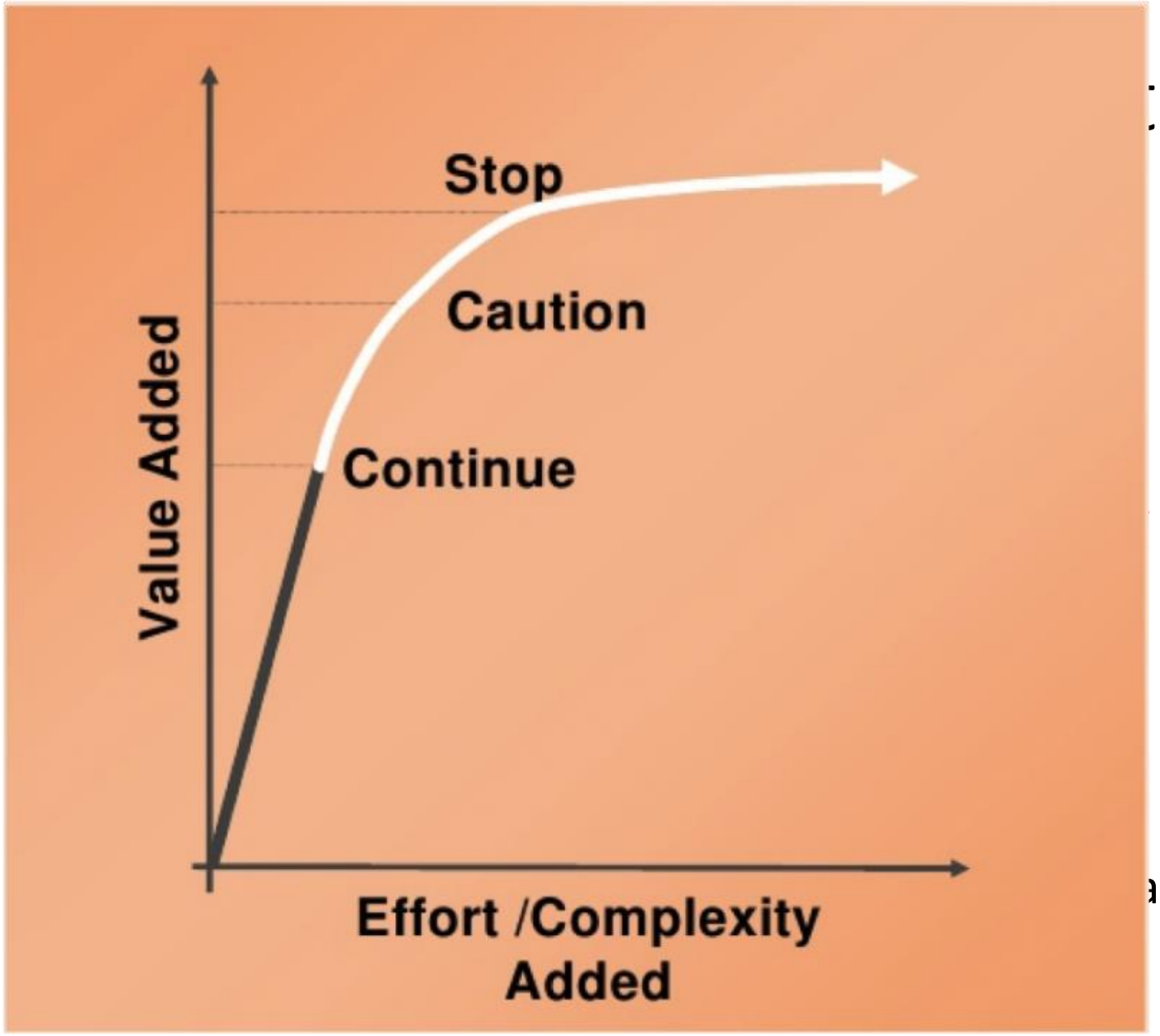


What Now? – Prototype 2 Project





What would add value?



terviews

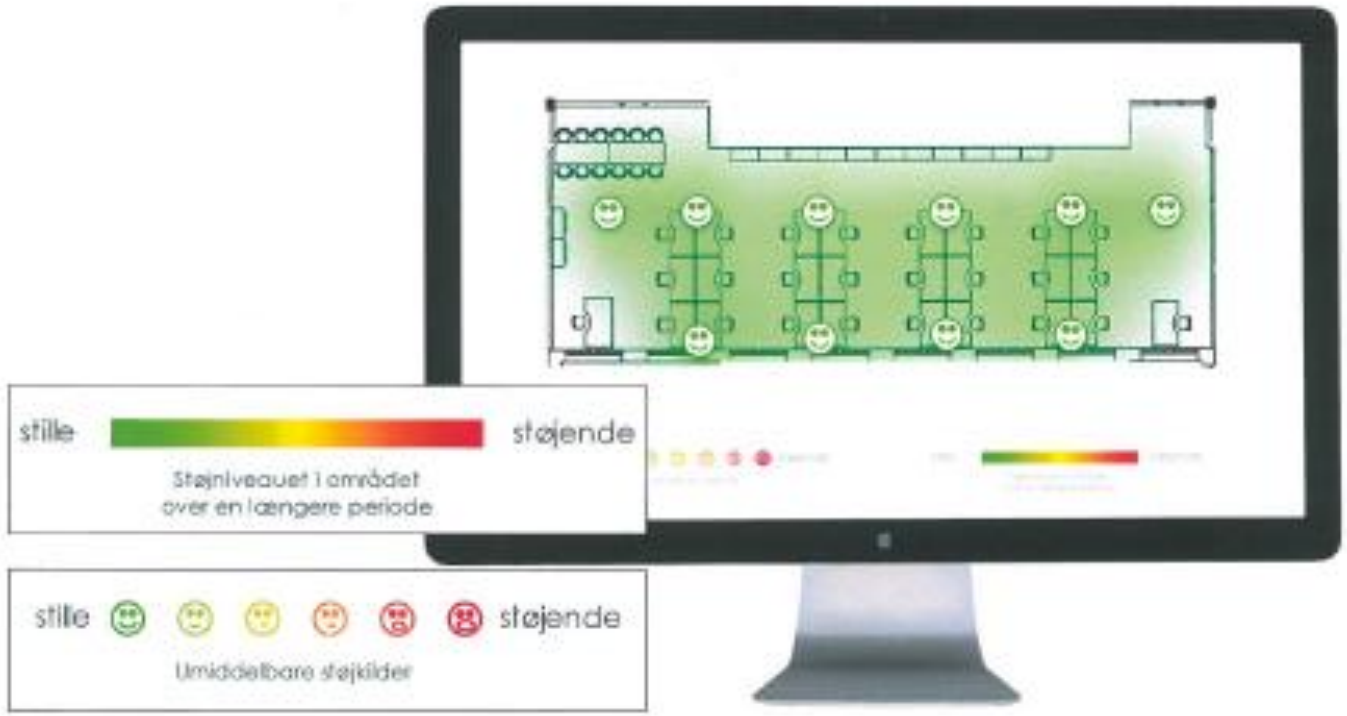
alue?

KISS Principle

scalable Solution

Bring the Noise Guide from the Wall to the users
-Make a “Noise Guide Light”

Want This (But Simple)



- Personalized
- Not Top Down
- Easy Installation
- Portable or Permanent
- No Tutorial Neede

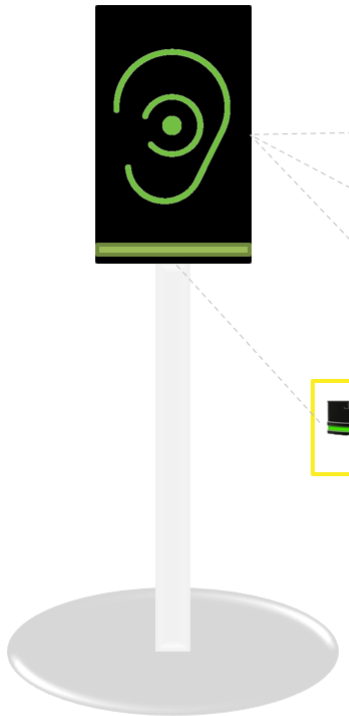
JABRA Noise Guide

In recent years an increasing number of people find themselves working in an open office environment. However, these are some of the facts:

- Up to 70% of office workers say they are disturbed by noise.
- More than 50 % are say they are interrupted by colleagues.
- Knowledge workers report being interrupted as often as every 10 minutes.

With the Jabra Noise Guide we are introducing a solution that directly targets the cause of the noise problem: The noisy conversations.

The sound ear indicate the instantaneous noise level and gives immediate feedback.



The Noise guide has 2 simple indicators

- the soundear
- and the bottom light

Green indicates the speech is within acceptable limits.

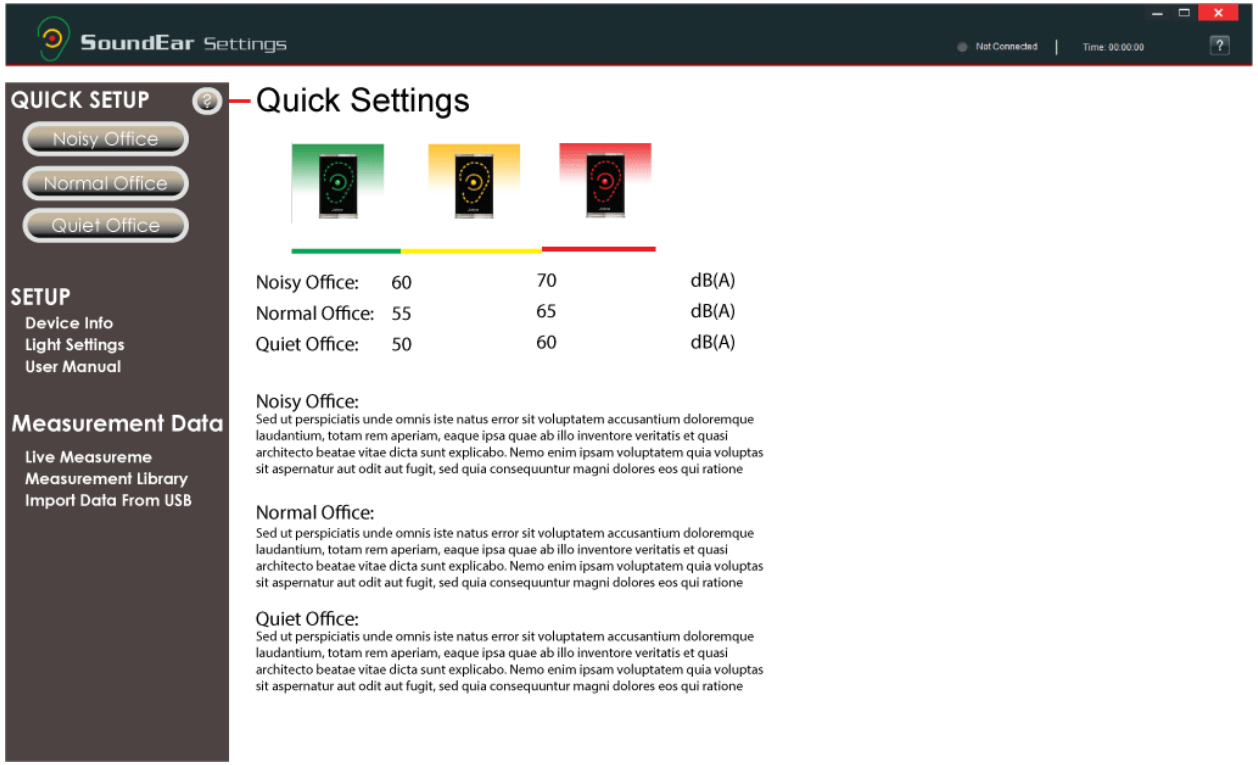
Yellow, the speech is approaching the limit.

When the ear turns red, it indicates that the speech can disturb colleagues, so you should continue the conversation elsewhere, or speak quieter.

The light indication on the bottom part shows the average noise level for a longer period – typically 15 minutes.

The Jabra Noise Guide comes with different attachment interfaces, to fit different office 'setups'.

Jabra®
YOU'RE ON




Left the Door Open…….