

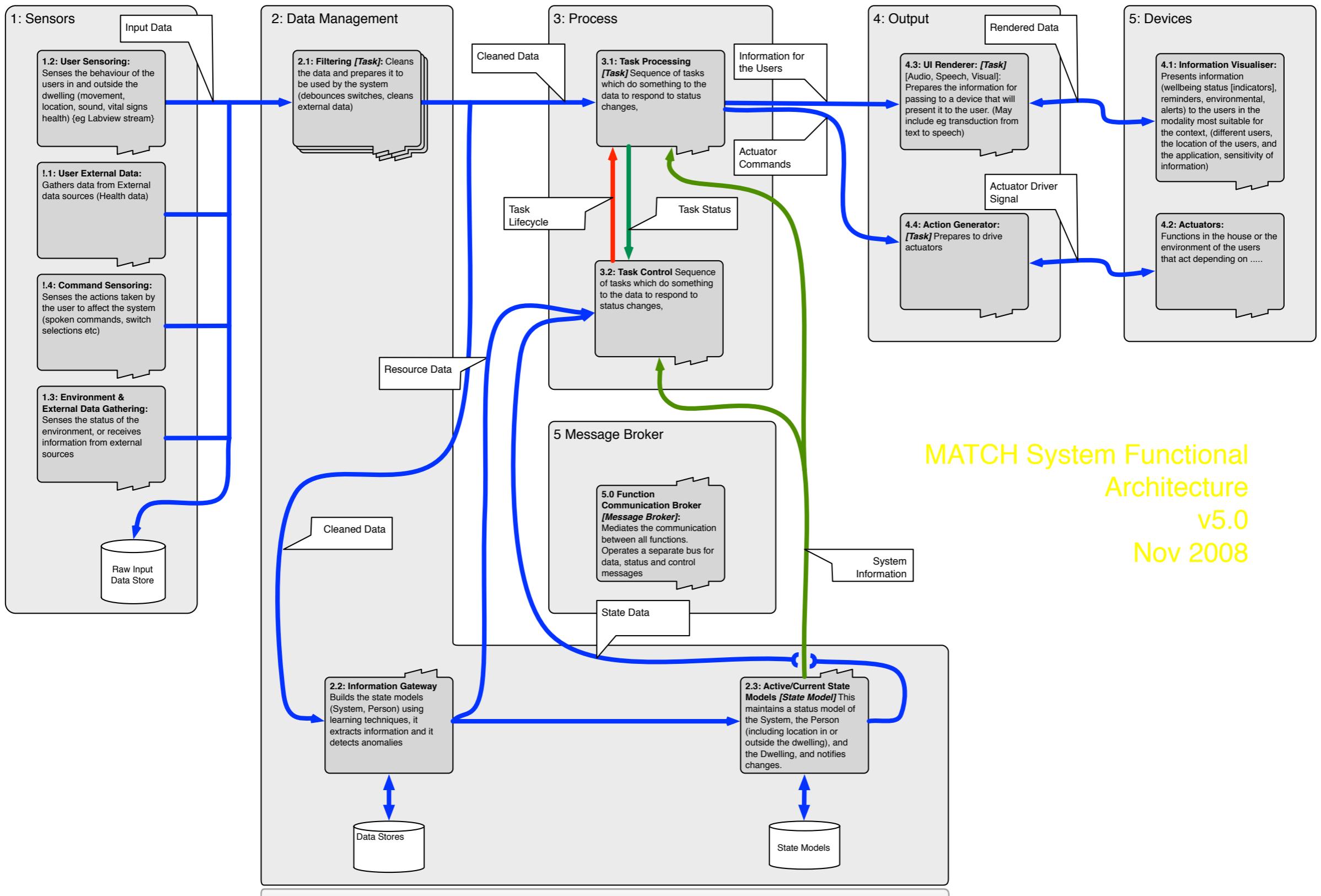
Telecare Technology ...

Functionality and User Experience

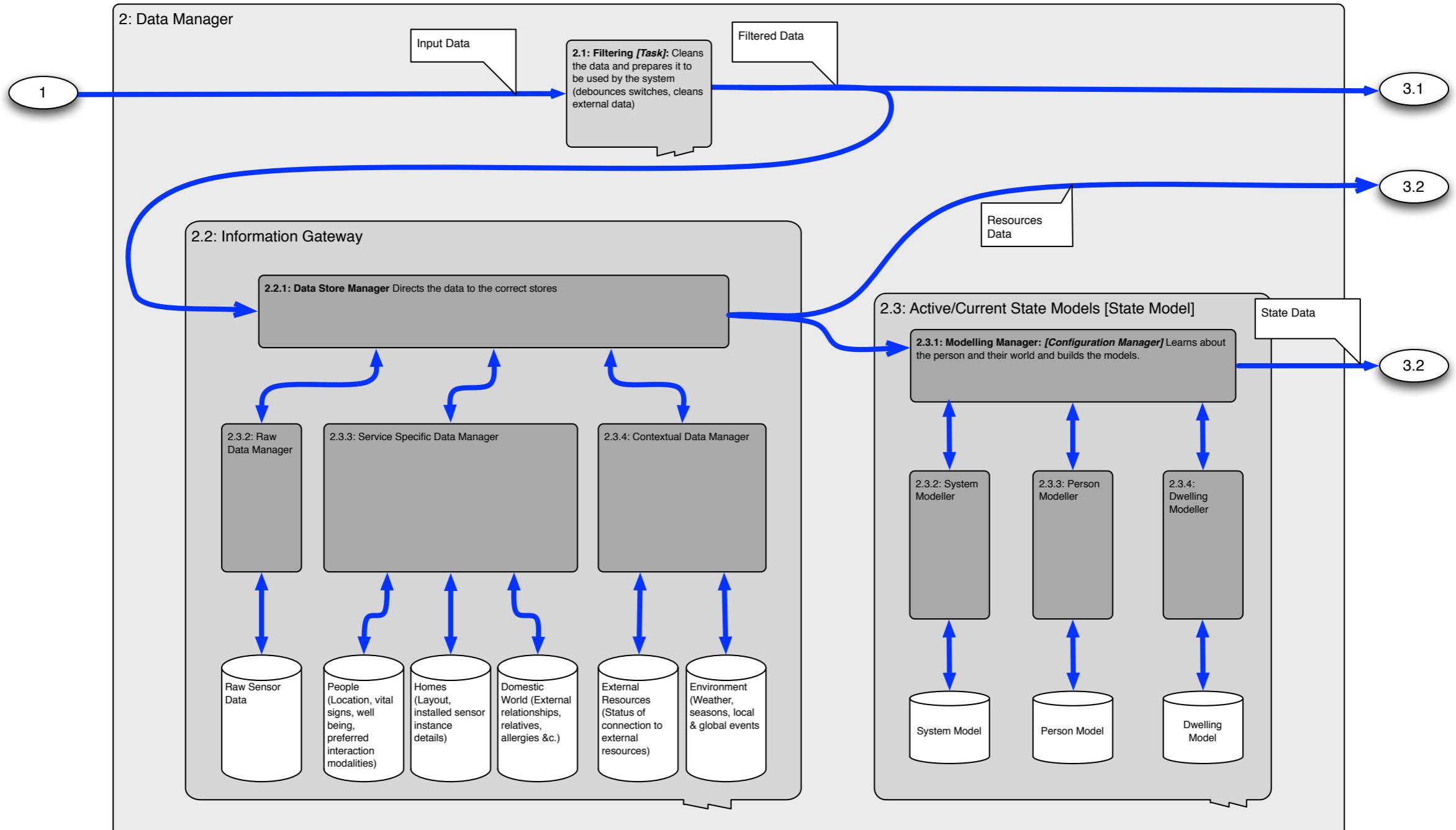
Friday

- Data Visualisation
- Data Segmentation
- Data Mining
- Task: Propose Data Processing Solution for your Client

Functional Components of a Telecare System

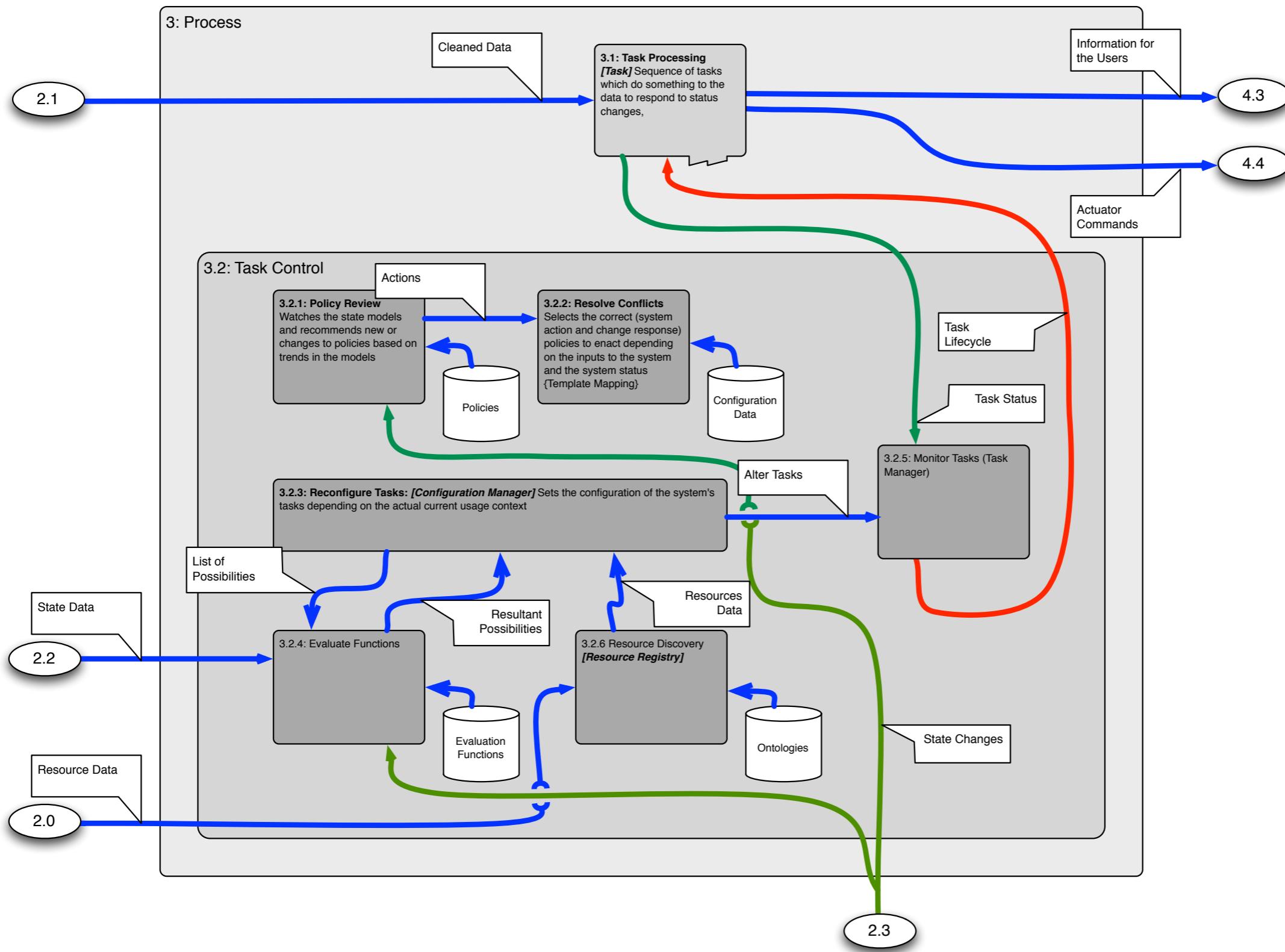


Data Storage Functions

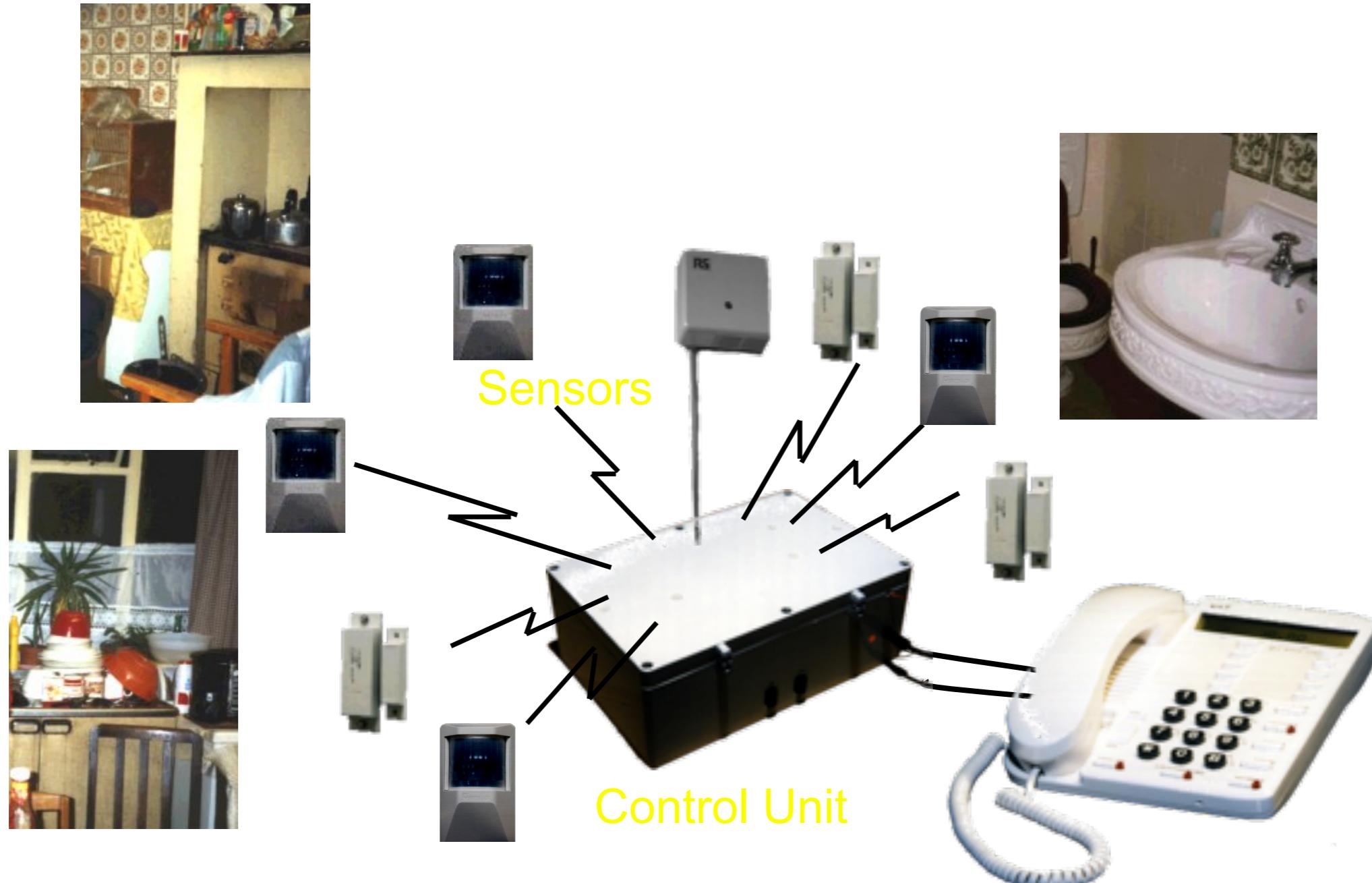


Data Processing Functions

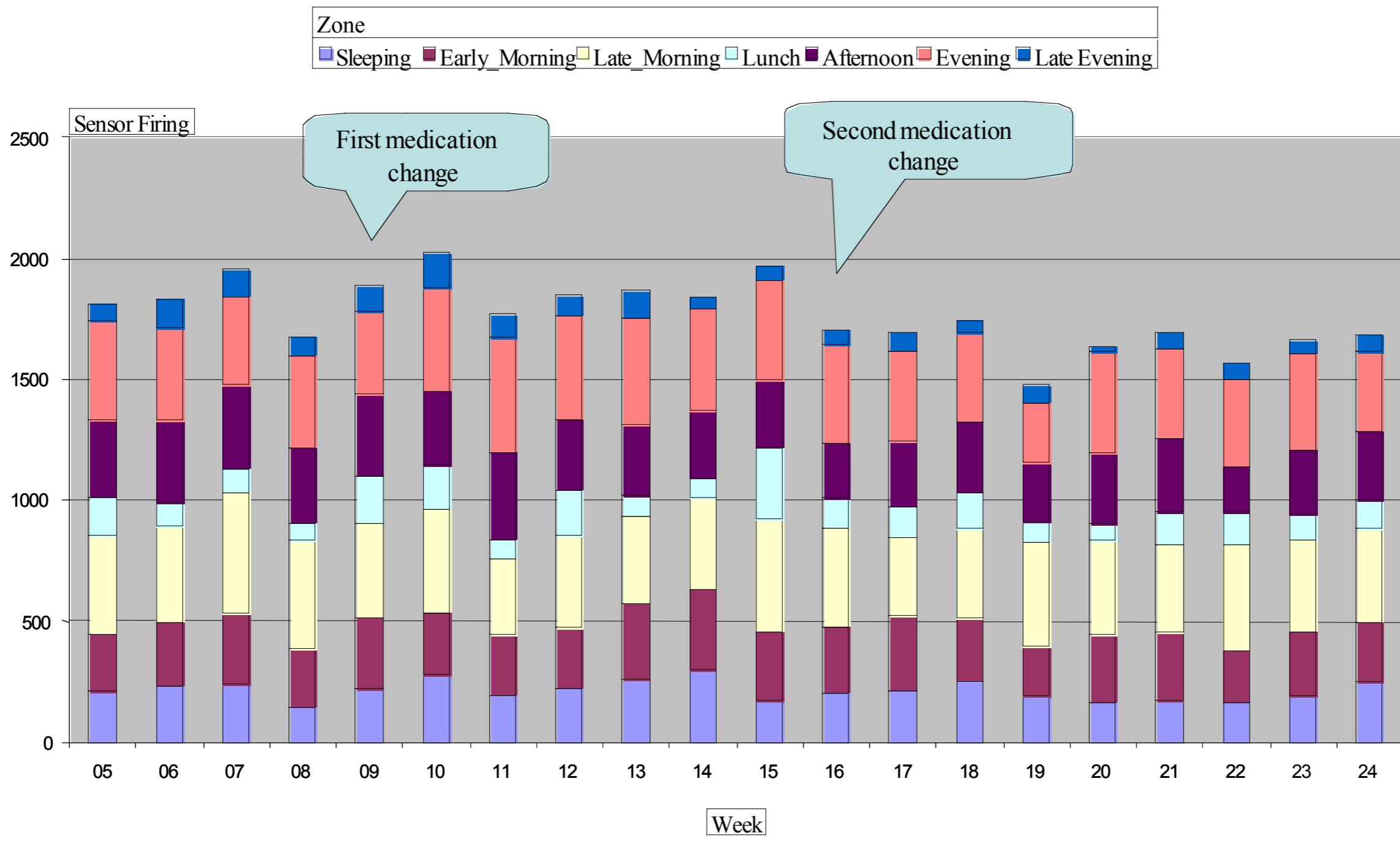
WATCH System Functional Architecture
v5.0
Nov 2008



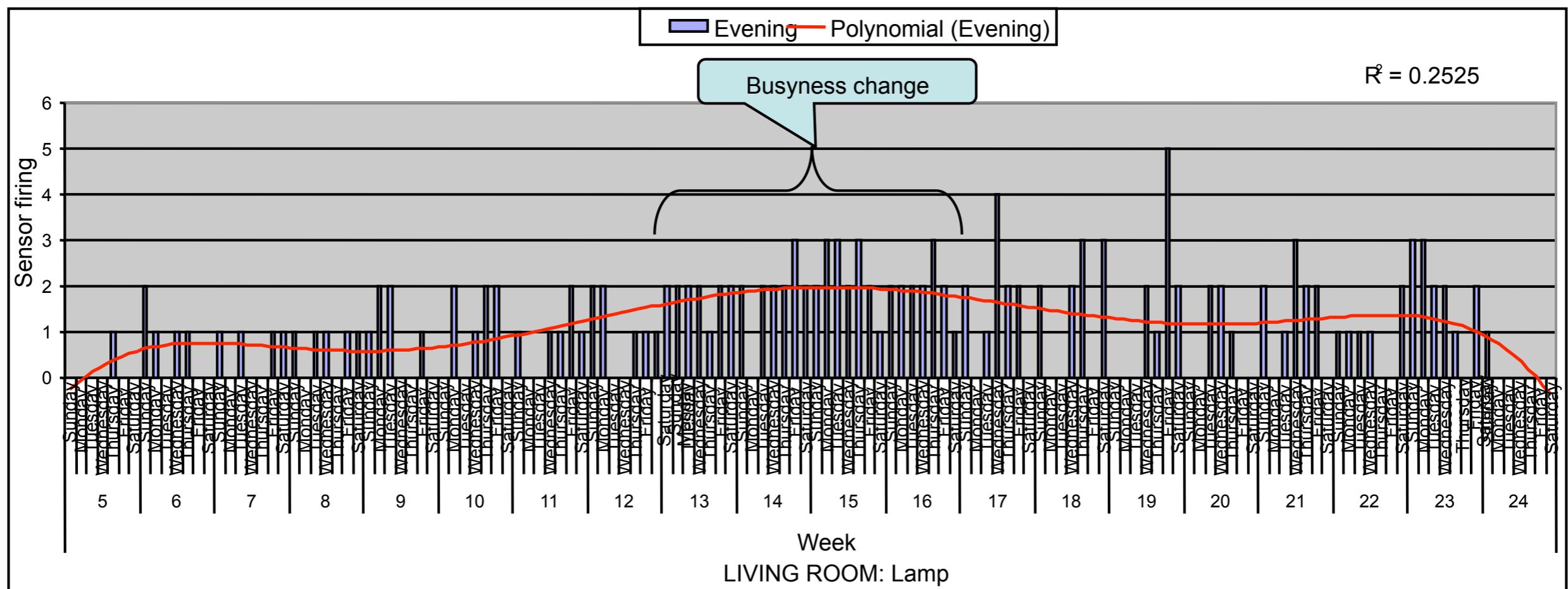
Lifestyle Modelling



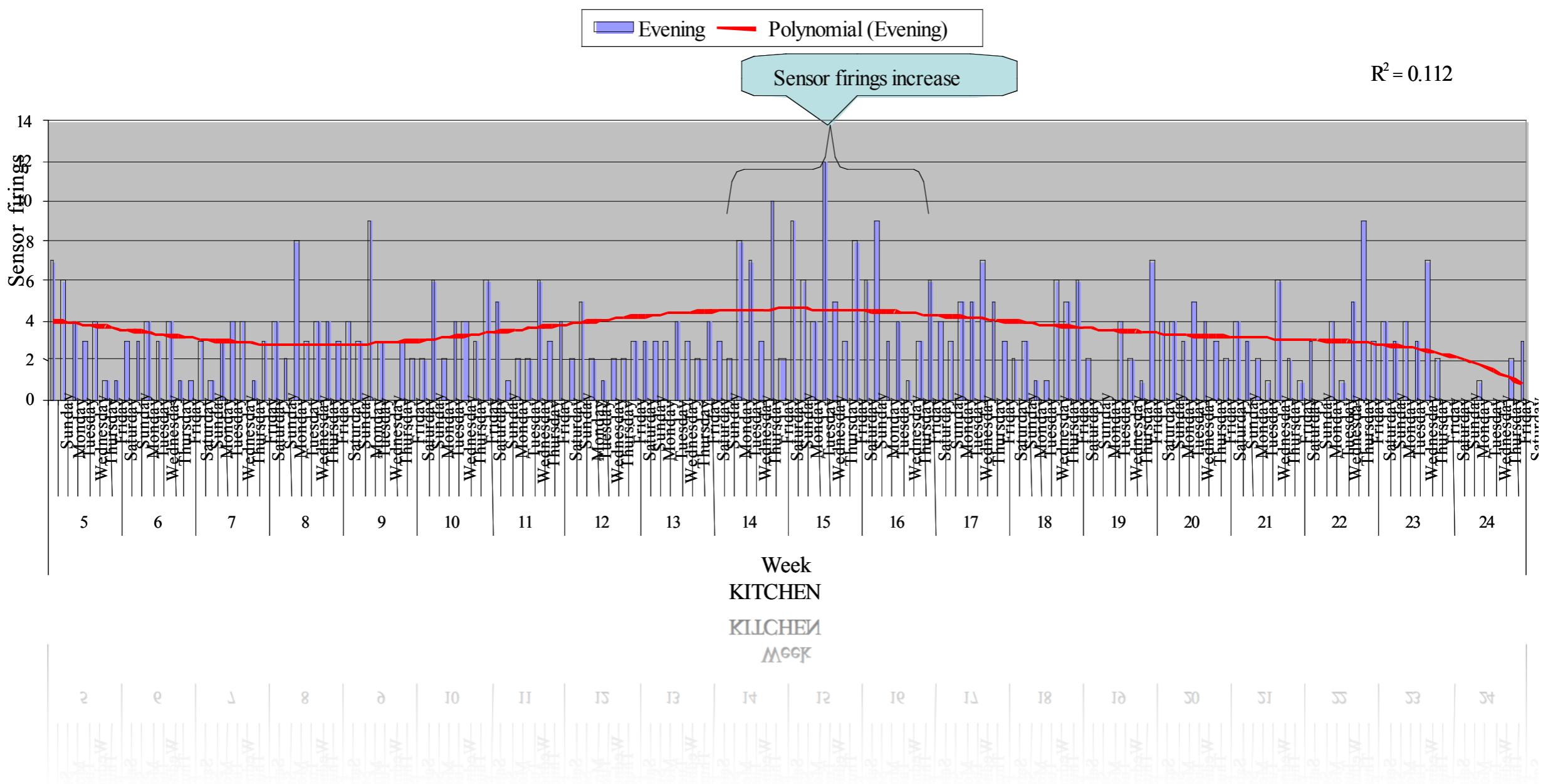
Data Visualisation



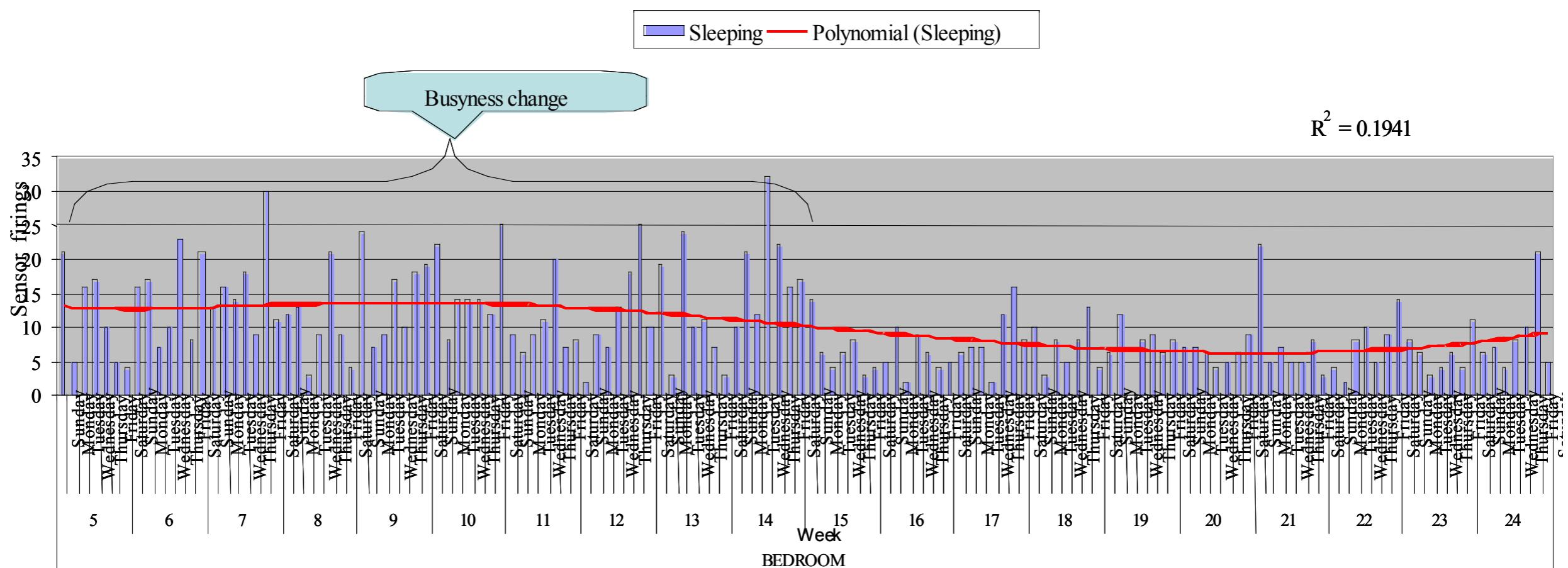
QoL Changes in Data



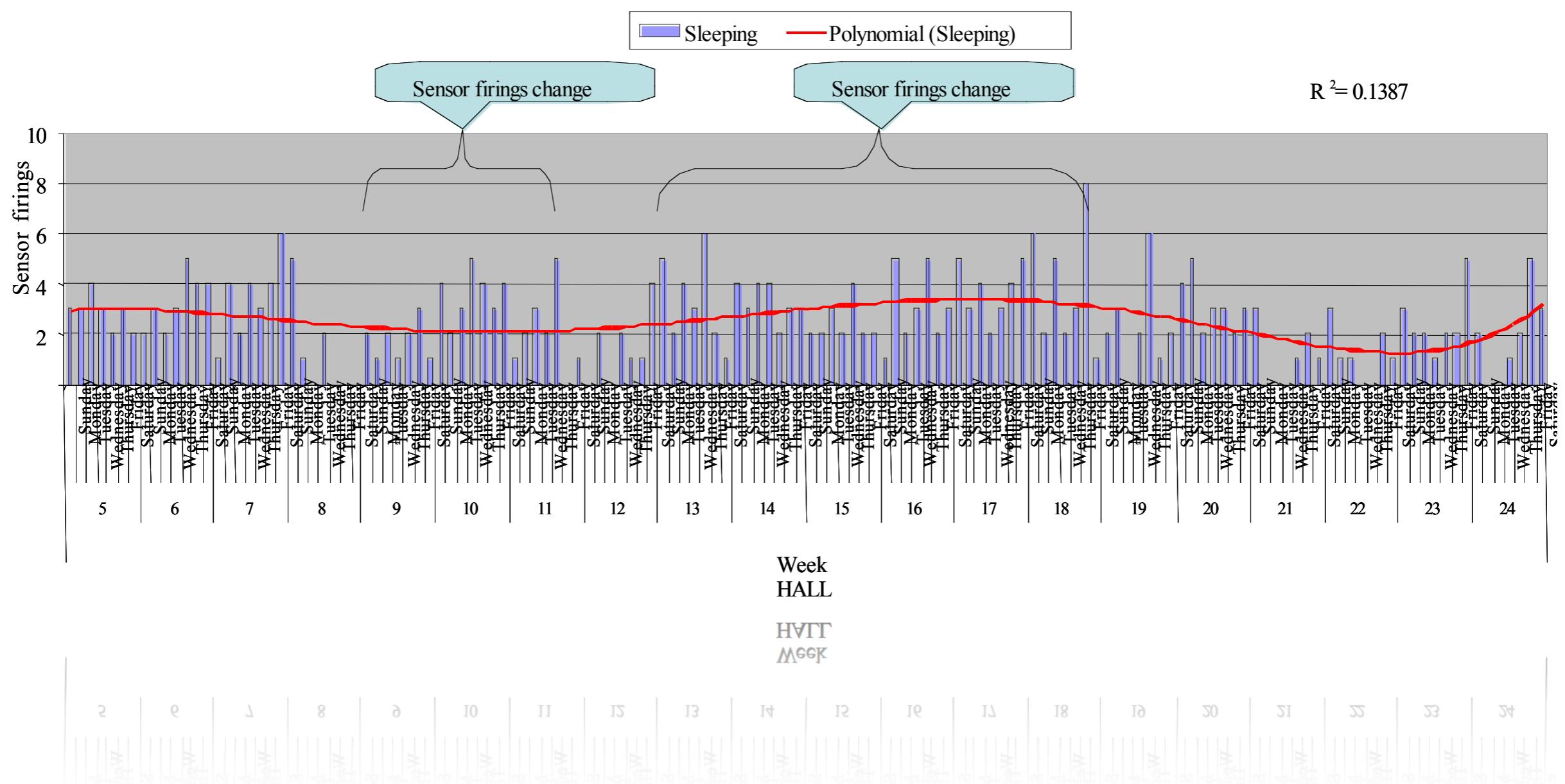
QoL changes in Data



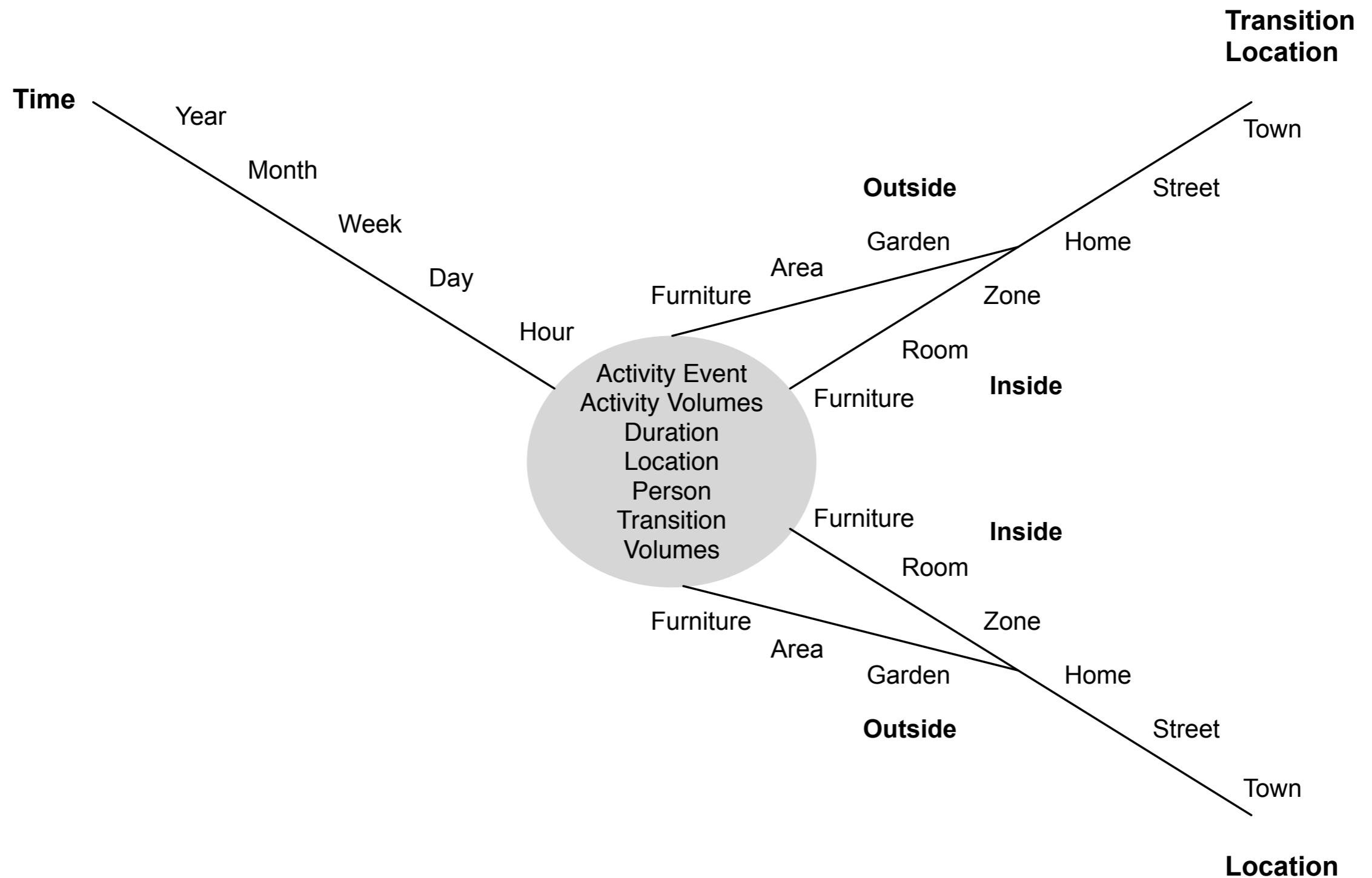
QoL changes in Data



QoL changes in Data



Data Segmentation

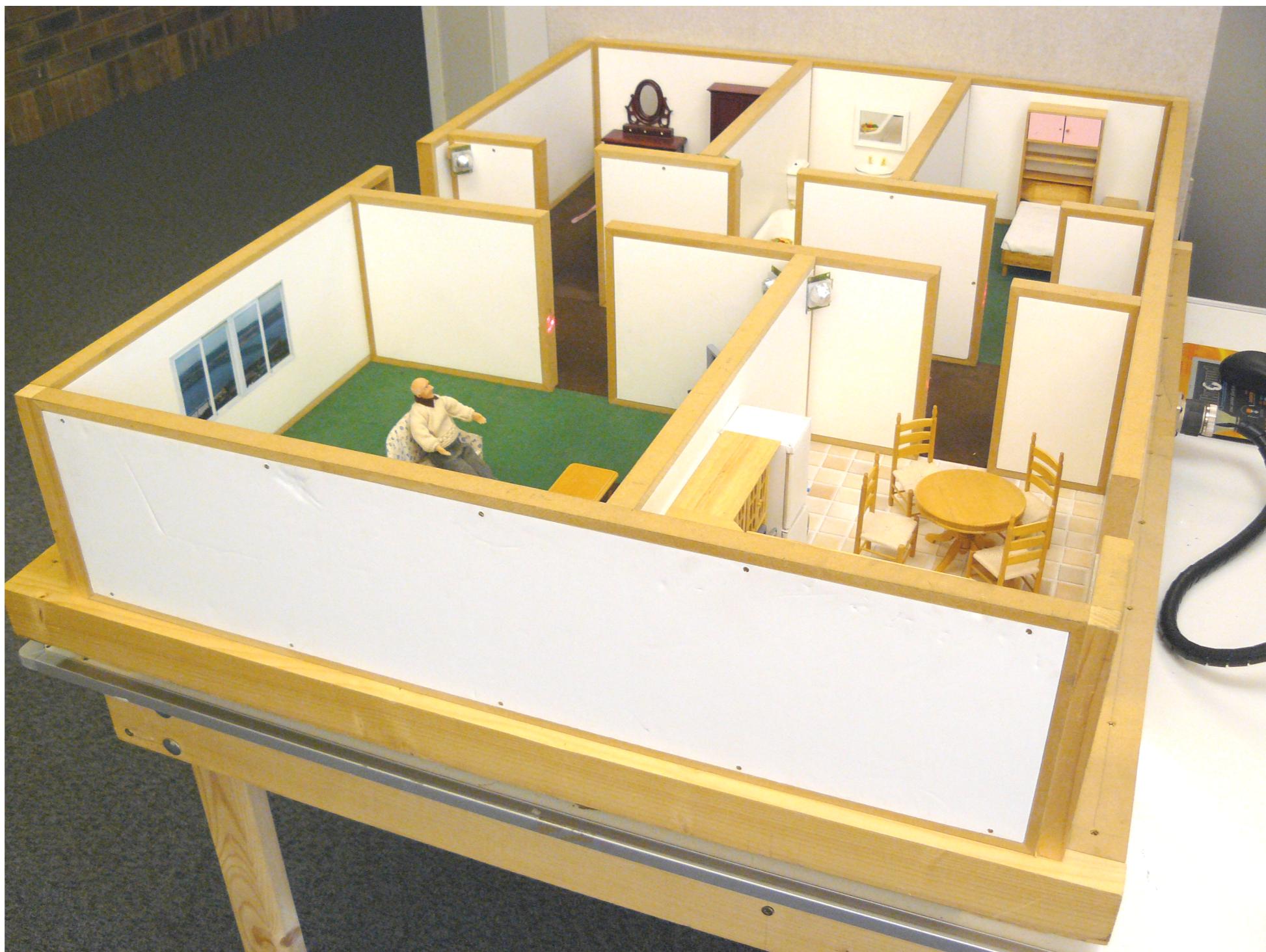


Database Segmentation

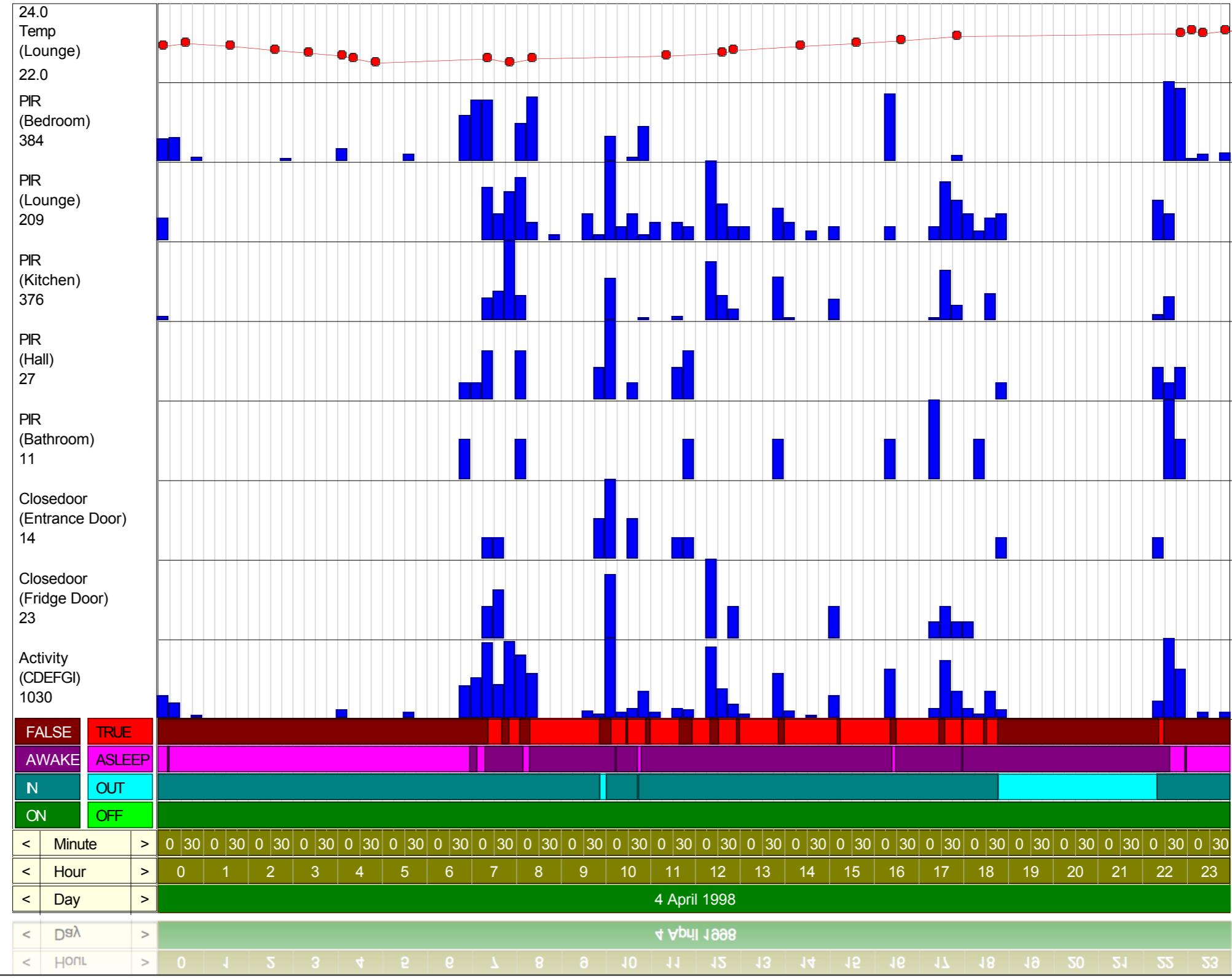
- Break up the data in ways that reflect the reality that you want to model.

Time Zone	Time Period
Sleeping	9:30 pm - 6:00 am
Early Morning	6:00 am - 9:00 am
Late Morning	9:00 am - 12:00 pm
Lunch Time	12:00 pm - 2:00 pm
Afternoon	2:00 pm - 5:00 pm
Evening	5:00 pm - 8:00 pm
Late Evening	8:00 pm - 9:30 pm

Dolls House & Simulated Data



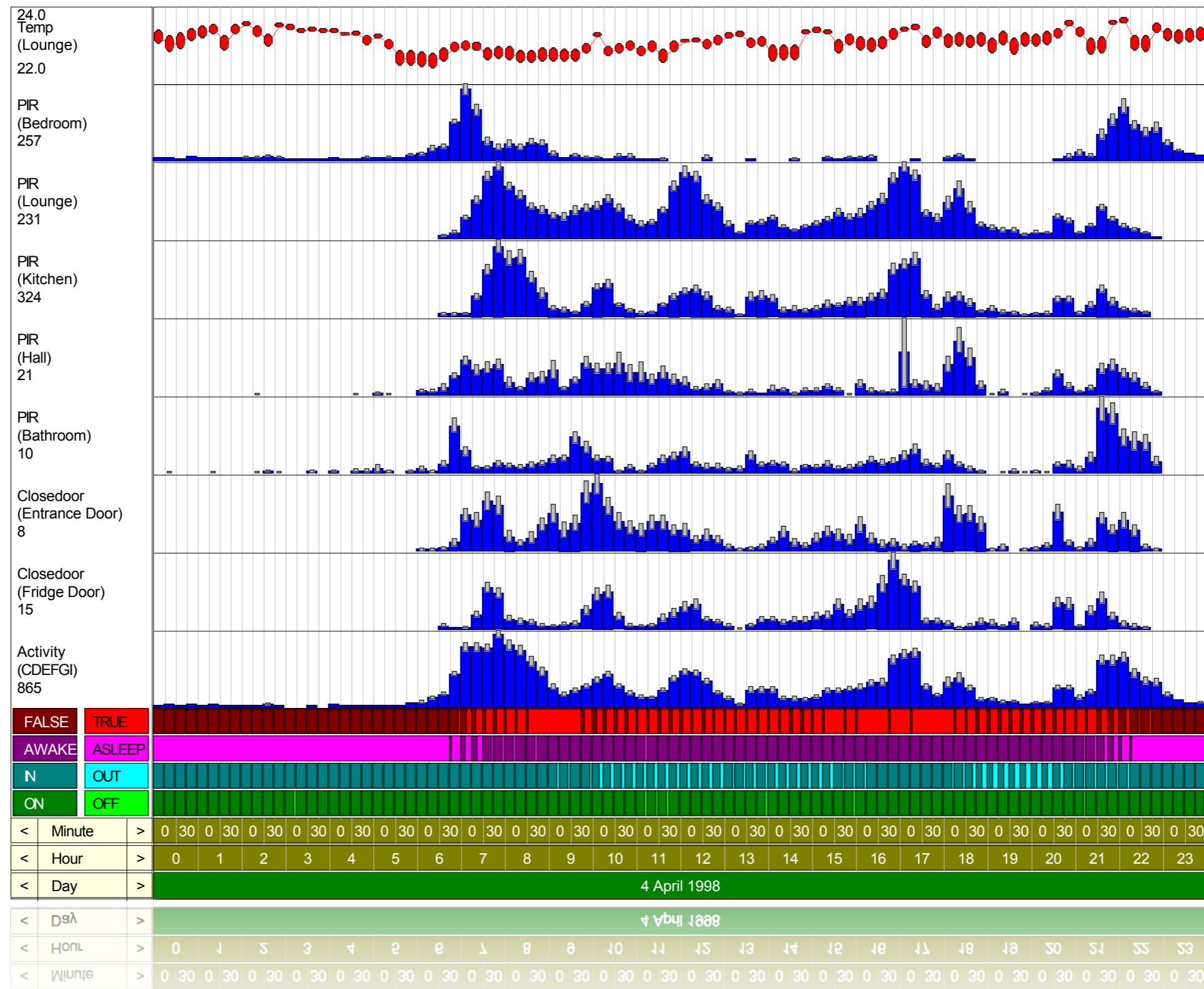
Lifestyle Data: What do people do?



Predictive Modelling

- Use the database to build a model from which future data can be predicted.
 - Build a model using training data
 - Test using new data
 - Predict future data

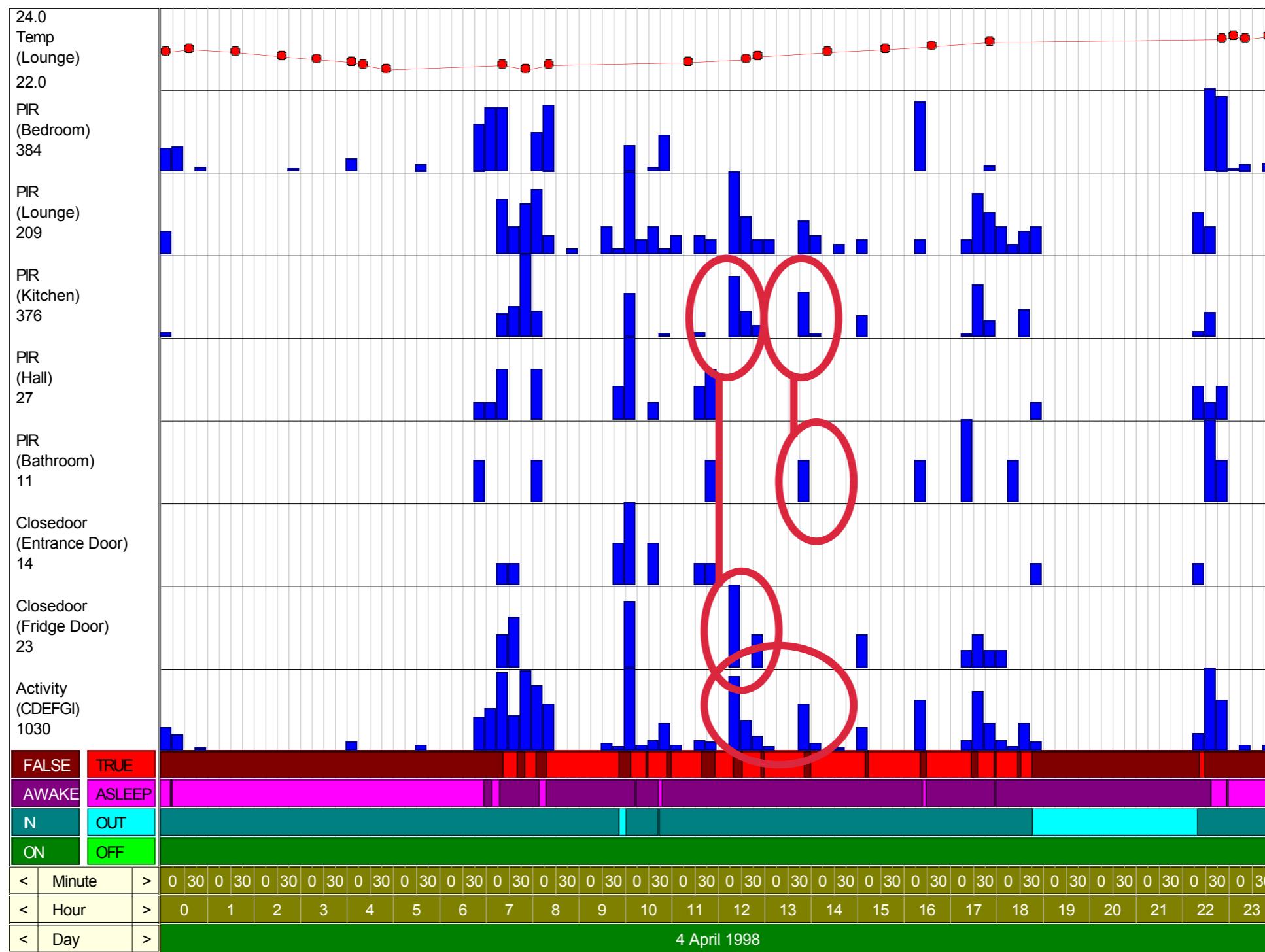
Supervised Learning



Link Analysis

- What activities are related to other activities?
 - Discover patterns of related activities
 - Discover activities that are indicators of anomalies in other activities
- Unsupervised Cluster Analysis

Lifestyle Activity Linkage



SQL Server Data Mining Algorithms (I)

- Is it possible to determine if a person is displaying symptoms of a condition for which they are at risk (predictive) or if they are continuing to smoke based on their home behaviour (historical)? This could be explored with a Naive Bayes Algorithms.
- Can we decide when to propose a particular care intervention in preference to another? This could be explored using Decision Tree Algorithms.
- Is it possible to predict how events and seasonal changes will affect the lives of older people in their homes? This will be explored using Time Series Algorithms.

SQL Server Data Mining Algorithms (2)

- Is it possible to organise elemental activities (passing through a doorway, getting up from a chair etc.) into more complete activities (going to bed, preparing food etc.)? Is it possible to learn that certain behaviours or sensor firings tend to occur before a significant event (onset of illness etc) or follow an event (funeral, visit by family etc)? This could be explored using Clustering.
- Is it possible to recognise a sequence of elemental actions, even if they are surrounded by other events, such as preparing food, being in a place where food is eaten and eventually visiting the bathroom? This could

SQL Server Data Mining Algorithms (3)

- In a dwelling occupied by more than one person, is it possible to focus on the behaviour of one person where they are particularly vulnerable? This could be explored using Association Rules.
- Is it possible to guess at the meaning of home behaviours when clear rules or patterns are not available? This could be explored using Neural Network.

Practical Exercise:

Choose Data

- What Data Processing would help the Client?
- What Data Processing would help the Carers?