System Analysis

The upfront steps that were taken to create a shared understanding and to examine possible solutions in building the application are shortly presented in the current section.

Use Case Analysis

SmartCart in its final scope addresses two main use cases: the use case of creating a shopping list and adding items to it as well as the process of going shopping itself. The use case ``Go shopping’’ implements the main user interaction that consists of switching to the previous / next item and of marking an item of the shopping list as ‘added to cart’. This interaction takes place via gestures made by the user with its smartphone and detected by the SmartCart application.

**\subsection**{Relations between the captured Gestures

and the used Sensors}

Figure \ref{fig:DataModel} shows a model of how the smartphone, the sensors and the gestures that should be recognized are related to each other. The acceleration sensor provides information about the smartphone’s speed-up along its coordinate axes. In the most cases, these axes are not aligned with the standard x-y-z axes because of the smartphones orientation. Since the orientation affects the measured acceleration values, it has to be taken into account when recognizing the user’s gestures.

\subsection{Application Context}

The context of the application can be retrieved from figure \ref{fig:context}. The inputs are the values of the accelerometer $a\_x$, $a\_y$ and $a\_z$ as well as the angles $azimuth$, $pitch$ and $roll$ that determine the smartphones orientation. The current state and any other information of the application are visualized on the smartphone’s display.