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Capstone Deliverable 2: Introduction Write-up for Project (Summary & Problem)

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**OK NSESA: The Use of Voice Interface Systems to Assist Change Collection during Buying and Selling in Ashesi University**

The project seeks to explore the use of Voice User Interfaces (VUIs) to augment buying and selling in Ashesi University. Even with the emerging payment technologies, buying and selling in Ashesi University and others are done with cash, as oppose digitally. There is no issue with that. However, a lot more problems surface when the seller has to give change to the buyer. The inconvenience of getting change for buyers especially when the change amount is quite small, such as GHC 1.50 pesewas, 20 pesewas, etc. is becoming nerve-wracking.

One way shops handle the problem currently, is for sellers to either keep the change or merely tell buyers to come for their change later. Also, sellers hand a paper chit containing the change amount and date of purchase to buyers, with the idea that buyers can use the chit later for another purchase or to directly receive the cash equivalent. Certain times, sellers do not collect the full amount needed to buy a product to avoid needing to get change. For instance, a seller may collect GHC 2.00 for an item that costs GHC 2.40. Other occasions, buyers are forced to purchase extra items or purchase items in a manner, such that change collection, is avoided.

The current approaches to handling the issue are not satisfactory and tend to create auxiliary problems. Buyers often lose their chits, or sometimes forget to carry it on them, thus making them unable to purchase new items. Buyers being forced to prevent the need for change collection end up buying things they realize they do not need. The seller who issued the chit for a buyer, may not be around on the particular day the buyer needs to use the chit, and valuable time is wasted disputing about the authenticity of the chit and change. Buyers complain of losing change as well as sellers. It negatively impacts customer experience, and in effect, cripple the business. Resources such as chit papers, and most importantly, time, for a university student, is wasted. Also, there is a considerable sum of money lost in the system, especially when change collection is ignored or forgotten and chits are misplaced or destroyed.

This situation may be ripe for some technological intervention. The basic idea is for buyers' change to be converted to electronic currency which can be used for purchasing other items at Ashesi or for some additional electronic purchase. Also, they should be able to use their electronic change to buy food from the vendor if they accumulate enough. This process of converting change to electronic money during a purchase must be fast enough to be worth it. Sellers and buyers alike may be reluctant to waste precious time on 20 or 50 pesewas change

A voice interface may be a quick and efficient way for sellers to provide electronic change. In the situation where the seller may not have the exact change to give to the buyer, the buyer could say, for instance, "ok Nsesa, 50 pesewas change" and their electronic account gets credited. All the seller has to do is confirm the transaction of the change, at the particular instance, to approve the crediting. I assume it will be faster and more convenient than having to navigate a graphical user interface to perform the same task.

Part of the speed and convenience of voice interfaces lies in the fact that voice instructions can simultaneously be used for identity determination and authorization and thus skipping the process of logging in with a GUI. The project seeks to build a system that will allow sellers to give buyers electronic change through a voice interface and thus enhance the buying and selling on the Ashesi campus.