GS1 Australia

GS1 Australia MobileCom

Nutritional Health Research Pilot

Case Study

VICTORIA UNIVERSITY | A NEW SCHOOL OF THOUGHT

GS1 Australia MobileCom

Nutritional Health Research Pilot

Case Study

GS1 Australia's first foray into the use of mobile phone technology to assist consumers in making healthier choices when purchasing goods had been successfully completed with the help of academia and technology partners. The fundamental building block for this success was the data from GS1 Australia's electronic product catalogue, the GS1net data pool.

During an eight-week trial conducted by honours student Carla Battaglia at Australia's Victoria University's School of Biomedical and Health Sciences, during the Spring of 2009, overweight participants used mobile phones to scan bar codes on breads, breakfast cereals and biscuits and received a "traffic-light" rating of the sodium and saturated fat content of each of the products. The aim of the trial and research was to see whether participants would make decisions to buy healthier food based on the information they received.

The resources from a number of parties were called into play to ensure that the expected outcomes were achieved, not only from a health research perspective but also from the;

- Value and accessibility of extended packaging information from GS1net
- Technology requirements, both computer infrastructure and mobile phone application
- Research into the response from consumers into the use of mobile technology

Ms Carla Battaglia was supervised by Dr Andrew McAinch and Dr Michael Mathai and all trials were conducted through the Victoria University Clinic.

Using Technology to Fight Obesity

Obesity is a global epidemic that is the result of an energy imbalance, where energy intake is greater than energy expended.[1] Consuming a diet rich in fat, particularly saturated fat has long been suggested as a contributor to this condition, as well as the development of co-morbidities such as Type II diabetes, cardiovascular disease and hypertension.

One of these co-morbidities, hypertension, has been found to have risen over the past few years, where physical inactivity, alcohol consumption, dietary sodium intake and obesity have all been linked.[2]

Intervention programs and educational tools such as food labelling have been implemented to help the public gather nutritional information from food products. However, this information has often been difficult for consumers to interpret in regard to management or prevention of chronic conditions.

Using existing product nutritional information with modern technology has shown to be an ideal way of providing consumers with health information relevant to them.

Technology has become a major point of treatment and disease management in people with chronic conditions.[3] This is also true for people within older age groups who use the Internet for self-management of chronic conditions.

The aim of the current study was to incorporate this approach with the technology of mobile phones linked to a nutritional database to investigate how this may improve the accessibility of the information in an easily comprehensible format.

Males and females, overweight, with a Body Mass Index of more than 25 were recruited to take part in an eight-week pilot study that consisted of a four-week observational stage and a four-trial stage, where weekly three-day food diaries and shopping dockets were collected respectively.

According to information provided by the National Heart Foundation of Australia, recommended values and traffic-light categories were produced on all breads, breakfast cereals and biscuits gathered from the shelves of four major supermarkets in the Western Regions of Melbourne, Australia.

Mobile phones were used to scan these products during the trial stage (week 5 to 8) of the study, which found that 153 out of 193 cereal products were within the green traffic-light rating for sodium, whereas for saturated fat, 141 were green. For both nutrients, 104 cereal products were given a green traffic light.

Sweet biscuits had a higher saturated fat value then sodium as 100 out of 179 ranked green for sodium and 56 for saturated fat, with only 27 ranked green for both.

Breads, on the other hand had 37 and 91 green traffic light labels for sodium and saturated fat respectively. A total of 29 breads were ranked green for both values.

Creating a database with participating consumers' personalised characteristics, and combined product data of breads, breakfast cereals and biscuit products, of not only their description, but serving sizes, sodium and saturated fat content, produced a successful result when uploaded and accessed via a mobile phone device.

Participants' responses to the mobile phone device were very positive and supportive. While the short duration of the pilot study (eight weeks) and the limited range of products trialed meant the pilot's finding as regards altering consumer's food choices were not conclusive, this study has created a pathway for future research and the potential for development of a business-to-consumer (B2C) Mobile Commerce application.

[1] Dixon T and Waters A-M 2003
[2] Appel LJ, Brands MW et al. 2006
[3] Hagland M 1998

GS1net Data Holds the Key

GS1net is the electronic product data pool used by Australian and New Zealand food and consumer goods manufacturers to exchange product information and synchronised supply-chain data with their retailer trading partners. GS1net provides the assurance that data exchanged between trading partners is accurate and compliant with universally supported standards.

Through GS1net, trading partners always have the same set of aligned information in their systems, and any changes made by a company to one of its products in its database are automatically sent to all companies who do business with them. GS1net is compliant with the Global Data Synchronisation standard and is one of 28 global data pools connected through the Global Data Synchronisation Network (GDSN).

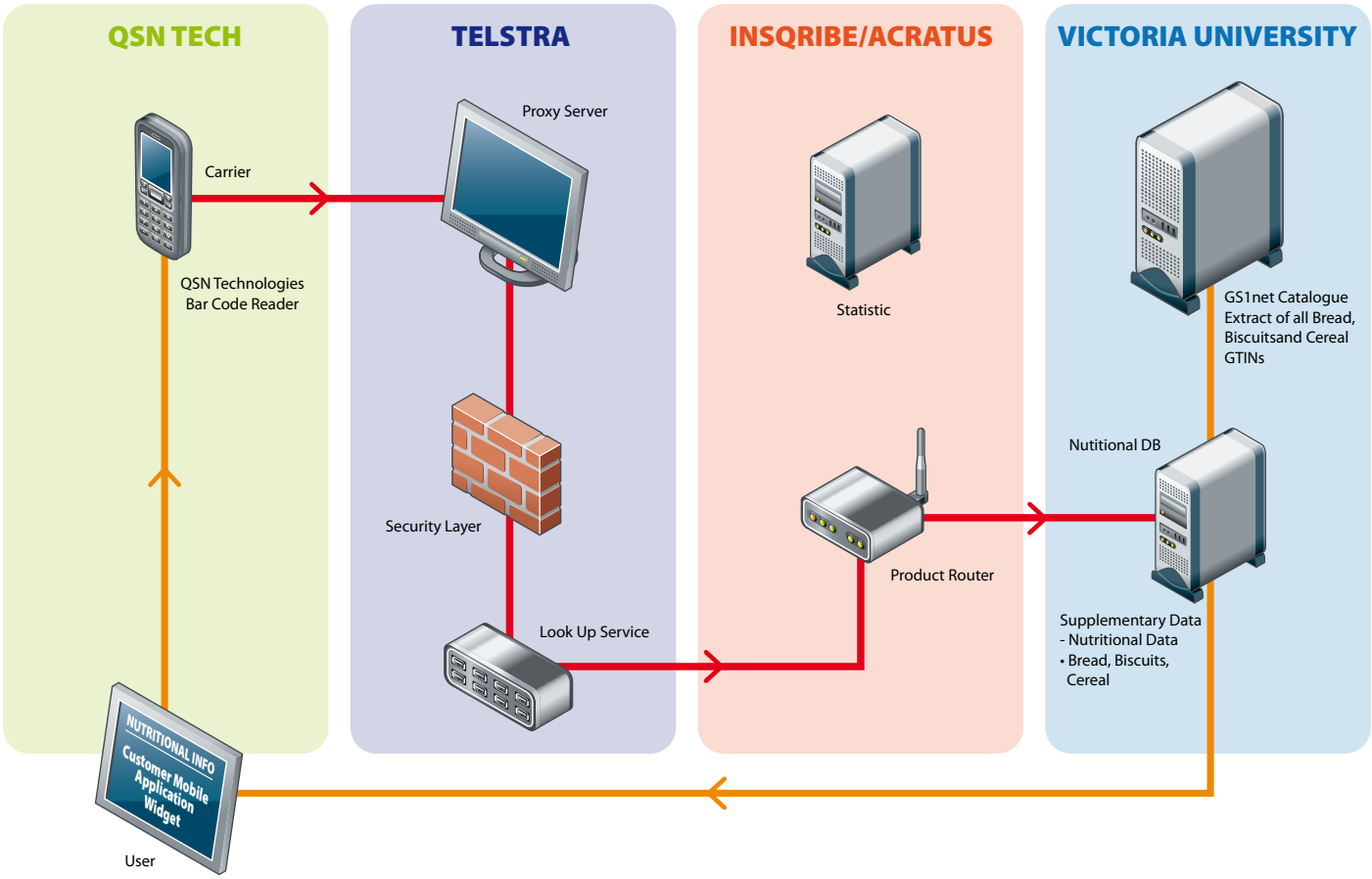
GS1net has product and pricing data on more than one million items, each identified by its Global Trade Item Number (GTIN) or commonly referred to as "bar code numbers". These numbers are displayed on products and represented as linear GS1 Bar Codes for scanning within the supply chain and at Point-of-Sale (POS).

Australia's major supermarket retailers require all suppliers to have GS1 Bar Codes on their products and have engaged with many of their trading partners through GS1net.

Considered a rich source of product data with "trusted" information, that is information that has been verified, GS1net was the database of choice for the Victoria University's Mobile Commerce pilot and research study, as it matched bar code numbers with product information. However, at the time of the pilot project, GS1net did not contain any extended packaging information, like nutritional information, against GTINs. This meant that for the research, the database records needed to be supplemented with the required data.

An initial extract from GS1net listing products and bar codes of breads, breakfast cereals and biscuits was provided by GS1 Australia. This was further expanded with sodium and saturated fat values 'per serve' and 'per 100g' being added after being manually gathered from local Coles and Woolworths supermarkets.

Victoria University Case Study – Nutritional Research



For the purpose of the pilot and research, the database with its supplemented information was hosted on the Victoria University computer servers. With another Victoria University Masters student, Vladislav Vintsarevich, from the School of Engineering and Science also joining the project, this information was converted to give a traffic-light reading by combining the general values for sodium and saturated fat from the National Heart Foundation and Food Standards Australia and New Zealand (FSANZ). Once the individual values were allocated a traffic-light symbol, the products were put into an excel file then uploaded onto a URL link created by Mr Vintsarevich. Mr Vintsarevich was recruited to the project by Dr Gitesh Raikundalia and Dr Michael Mathai.

Harnessing Mobile and Web Technology

Schepisi Communications, a Telstra Dealer, provided the project with 20 Nokia 6210 phones with a high-resolution auto–focusing camera, with access to the Internet arranged by GS1 Australia. In the spirit of international collaboration, GS1 France allowed its Codeonline mobile phone application developers to work on this Australian pilot on a fee-free basis. Codeonline is a GS1 France mobile phone application that identifies a product by capturing a picture of the bar code and routing the call out to the product's manufacturer web site. The application developer, QSN Technology, a Swiss company, had to make a slight modification to the existing application to route the call, via an Australian third-party web service provided by Insqribe, to the Victoria University's computer server for the purpose of the pilot project.

The Insqribe service was able to provide the data relating to the incidence of scans from the participants, as each phone was unique, which formed the basis of the research.

The data exchange model, based on the GS1 MobileCom Extended Packaging Pilot Handbook 2009, was an Indirect mode "to look up the source after scanning the bar code and to deliver information from the database to the consumer's mobile phone".

A web application was written which displayed the actual values per serve and per 100g of sodium and saturated fat for the product scanned. Based on an algorithm, a personalised percentage of the amount that contributes to an individual's daily intake could be obtained.

Analysis of Mobile Technology

As part of Mr Vintsarevich analysis, post-study questionnaires were used to obtain participants' feedback on their perception of the technology and mobile phone used. His analysis showed that over half (60%) of participants found it easy to start the scanning application on the mobile phone. In regards to the products available within the database, 74% stated that they scanned the products they were interested in. This showed that participants were willing to use the device to see how much sodium and saturated fat the scanned product contributed to their recommended daily intake and if this was a suitable choice of purchase.

Many participants seemed eager to use this device more often for a broader range of products as 31% said they would scan both four to eight and eight to 11 products each time they went shopping if this system included more food product categories. This is supporting evidence for the demand for this type of food labelling and extended packaging information strategy.

While a total 60% of participants did not change their product choice during the study while using the mobile phone to access the traffic lights data, 40% of participants did change their purchase from the information provided. While for the majority purchasing was not altered, the application made participants more aware of how much of a certain nutrient a product contributed to their daily intake, therefore they were able to rethink their diet.

The study established that while technology could provide accessibility of information, both educational tools and motivational techniques are needed to encourage participants to change their overall purchasing and eating habits.

Conclusion

Overall, the creation of the database and ability to obtain personalised values for sodium and saturated fat through a mobile phone application was a success. It is possible that with longer study durations and increased product availability on the database, participants using the mobile phone device to scan bar codes will potentially alter product-purchasing choices and consumption. The creation of a product database with valuable extended-packaging information, establishing it as a trusted source of data and enhancing its accessibility through incorporation of the mobile phone interface has made a pathway for future research regarding this food and extended-labelling strategy.

Lessons Learnt

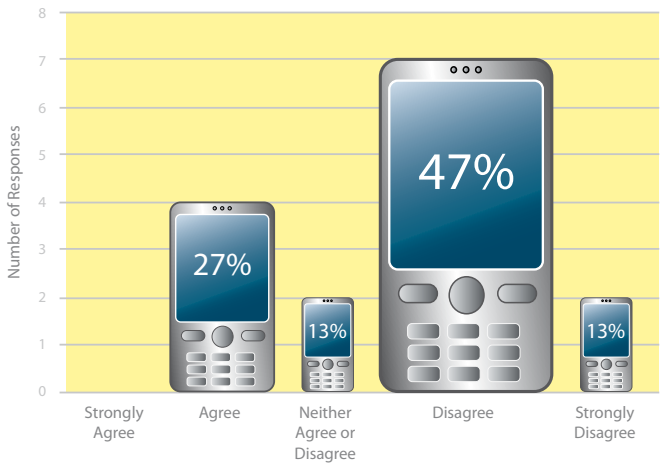
There were a number of valuable lessons learnt from the pilot study. While the study itself involved only eight weeks, there were a number of preparatory steps and post-study conclusions worthy of mention. These include;

- Lessons from the manual data entry of supplementary information to the GS1net product data base. For the exercise to be sustainable in the future, an industry set of extended-packaging information will need to be determined, supported by a process to automatically populate the data.
- The mobile phone application needed to be modified to scan the bar code in a sequential "shopping list" type scenario, rather then in its first iteration where the application produced one set of results, but then required the user to recommence the start sequence.
- Codeonline was a GS1 France mobile phone application and only certain mobile devices were compatible. While there was a comprehensive list of available devices, not all mobile phone models were available in Australia. Future applications need to be available on current and popular mobile phone models.
- Mobile phones without auto-focus capabilities were problematic as it required the consumer to align the bar code symbol to the camera. This was further accentuated when supermarket in-store florescent lighting would interfere with the scanning process. Low-resolution mobile phone cameras were also problematic.

Survey questions on:

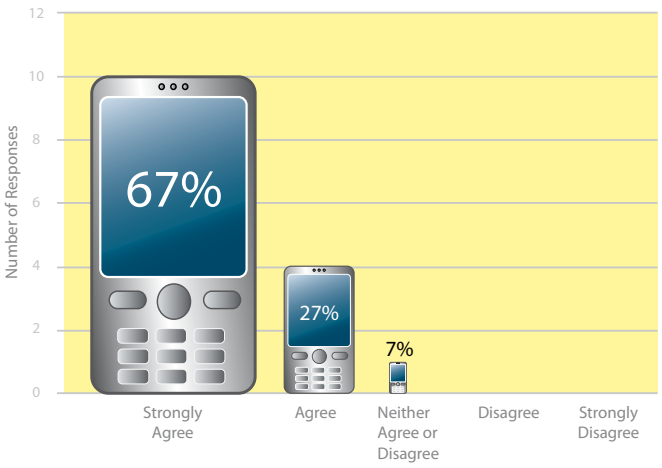
Shopping Behaviour

Based on the information provided to you via this system you changed your purchase choice.



Product Range

The system would be more useful to your needs if a greater product range was included.



- The pilot provided clarity of the various roles of each actor in the scenario, e.g. the role of telecommunication carriers, the need for mobile phone data plans and the difference between web-application interface vs. the database application.
- If future applications relating to purchase choices linked to consumers' profiles are pursued, there will be a need to consider non-technical issues such as the privacy of personal data, a disclaimer relating to medical-related recommendations, data accuracy and the responsibility for maintaining accuracy, correctness of system algorithm and the ethical question of establishing shopping profiles.
- As the bar code is the key in accessing the data, products without bar codes such as fruits and vegetables will need to be considered if mobile phone applications were to be expanded to all supermarket items.
- The need to establish the challenge and systems requirements to incorporate in the future, information on other foods e. g. restaurant meals, convenience foods, cultural food items such as Chinese, Vietnamese and Indian which are sold in specialist stores.
- Can the application be designed so that the mobile phone does not have to connect to the internet each time? Perhaps it can it be updated each month to reduce usage time and possible connection problems in store.

These lessons learnt will need to be the subject of consideration when future mobile phone applications and strategies are discussed, planned and implemented.

Looking Forward

Since this was a pilot study, the potential exists for further study to encompass a broader array of product data and functions. Working with GS1 Australia and other businesses to expand this system and application will enable the extension of this database to a wider choice of mobile telephones. This will allow a wide range of mobile phone companies and networks to support consumer information and education programs and encourage better health and well being.

Expanding the database to include the majority of products within the Australian supermarket range, as well as the inclusion of the main nutrients and other attribute information found on food labels, e.g. allergens, additives and environmental sustainability, would also benefit consumers. In addition it will cater to a broader range of people who are health conscious, with certain ailments, or even those who may be environmentally aware when making their purchases. Furthermore, extending this application to calculate daily intakes and allow for the mobile device to have a memory storage capability and to compare values to the next item scanned would also be something to work towards. This type of extension would provide people with the opportunity to use these mobile devices as an adjunct to their nutritional or health and well being consultants.

The overall concept of using mobile phones to access nutritional information via a trusted database source has been found to be a good tool to enhance and produce future success in the delivery of nutrient details. Using mobile phones to access this database has given worthwhile feedback on the function and layout of the device to improve it. Furthermore, it supports the GS1 Australia's alignment with the GS1 Global initiative of MobileCom.

References

Appel LJ, Brands MW, et al. (2006).
"Dietary Approaches to Prevent and Treat Hypertension."
Hypertension 47(2): 296-308.

Dixon T and Waters A-M (2003).
"A growing problem: trends and patterns in overweight and obesity among adults in Australia, 1980 to 2001."
Australian Institute of Health and Welfare(8): 3-4,10.

Hagland M (1998).
"Managing disease by managing IT."
Health Management Technology 19(7).

Battaglia C, Mathai ML, Raikundalia G, Vintsarevich V, Pereira S, Housseas D and McAinch ML.
Mobile phones a key to decoding healthier food choices.
Australian & New Zealand Obesity Society congress, 2009.

Sponsor Logos

GS1 Australia

Head Office
Axxess Corporate Park
Unit 100/45 Gilby Rd
Mt Waverley VIC 3149
Locked Bag 2
Mt Waverley VIC 3149
T +61 3 9558 9559
F +61 3 9558 9551

Sydney Office
Lakes Business Park
Building 4B, 2-4 Lord St
Botany NSW 2019
Locked Bag 7002
Botany DC NSW 2019
T +61 2 9700 0933
F +61 2 9700 0820

National Number: 1300 366 033
ABN: 67 005 529 920

www.gs1au.org