

# Chutney and Relish: Designing to Augment the Experience of Shopping at a Farmers' Market

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## ABSTRACT

We report on designing augmented reality (AR) applications to support the practices of *going shopping*, using an accompanied shopping and reflection technique to assess the key points of engagement among shoppers and producers at a farmers' market. Our goal was to deploy innovative mobile technology in a low-tech context so that it supported everyday behaviour. The paper documents how a short research intervention was decisive in shaping the applications designed for the AR tool and explores how stories told as part of the market and in interview were used to help organise our insights.

## Author Keywords

Fun, shopping practices, farmers' markets, narrative, augmented reality, mobile, experience, QRcodes

## ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## INTRODUCTION

*"Clearly the personality of everybody there is 90% of what you are getting, of the whole fun experience: it's great. And I've come away with a goat's cheese, for goodness sake, which is really unlike me."* (In, shopping at a farmers' market, southern England, 2009)

Shopping is more than the utilitarian act of buying: it involves complex practices and a range of associated experiences. Technology to support shopping practices must be embedded into these. We set out to experiment with the potential of a particular AR approach that provides a means to prioritise information at hand from trusted sources. At outset, the nature of this information was not clear, but it was assumed, in the words of one developer, that the potential of the tool to save and show comments in an order ranked by shoppers would be 'used to determine the trustworthiness of particular stalls and sellers through the provision of a ratings and comment mechanism such as that used by eBay and Amazon' (Wakeman, team notes, 2010). In fact, observation and interview showed a different role emerge for exchange of information in the market, and, by extension, for the tool. In this paper we document the way that our process revealed insights about relations in the market between

people, information and objects. And we draw attention to narrative as an organising principle, both for our participants engaged in a series of rich experiences while shopping, and for deciding how to intervene effectively.

We used the context of a farmers' market as a form of extreme testing. First, these markets are places where shopping is expected to be full of diverse pleasant experiences (Bullock 2000). Markets are increasingly thrown into contrast with online retail, which extends the role of digital technology to mediate between buyer and seller and stresses the utilitarian aspect of buying. With this contrast, we might expect an increasing focus on aspects of *being there* in a marketplace. Second, it is a *low-tech* situation where there may be no centralized power supply but many mobile devices. If digital tools are becoming ubiquitous, then they will be available in future in just this kind of environment across the world. So we asked: Can we augment shopping in this context in a way that is useful without destroying the pleasure?

## BACKGROUND: STUDIES IN SHOPPING

Much research has gone into online marketing, buying and selling. Far less is known about how to support the practices of *going shopping* electronically. Farmers' markets appear only for a day a week/month, are often open air and stock only a few of the goods that make up a typical monthly shop, so clearly they are not attended for their ease of use. Instead, the market fulfils a different role. In this section, we review insights from existing studies of shopping and the tools designed to augment it.

## Markets and shopping experiences

In a world of increasing internet commerce for standard or bulky items such as washing powder, books and electronics, buying food in a situated, occasional form has special appeal. Shopping at the local grocery store used to be an opportunity for shoppers to chat while waiting to be served and comment on the clerk's remarks and product quality (Esbjerg and Bech-Larsen 2009: 421). Market shopping preserves and builds on these relations. Friends of the Earth identify (Bullock 2000) many reasons why shoppers might use this source: indirect benefits to farmers, the environment and the local economy, the atmosphere and experience; fresh, healthy produce at competitive prices, often where there are no alternative sources; and building up social connections through shopping locally. The sociologist John Sherry famously studied a flea market and challenged the prevalent view that shopping can be reduced to the analysis of purchasing and selling (1990). He describes markets as

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festive-informal, where social aspects of the interaction among shoppers and with stall-holders form a significant reason for visiting such events. Similarly, in car boot sales (Gregson and Crewe 1997), the market space is: “one where people come to play, where the conventions of retailing are suspended and ... participants come to engage in and produce theatre, performance spectacle and laughter.” Stories are part of selling (eg Rolfe 2003). Brands have stories attached to them to build their identity while products have blurbs on their packaging to enhance their meaning to those buying. The use of narrative in informal settings differs from the marketing of big business. In Sherry’s words, “[d]ealers impart meaning to their goods, providing cultural biographies for objects, which many consumers believe enhance their value. In fact, these “stories” or “histories” are sought by some consumers as avidly as the objects themselves.” (1990: 22). Lawson (2010) offers a related reading of artisan transactions: “when I buy X, I’m giving [money] to artists in exchange for them being awesome. Awesomeness is something I’m willing to put a cash value on. As are lots of people.” He presents transacting as social, as gaining the right to identify with a producer. At farmers’ markets, where goods are closely identified with a production story, this view is highly relevant.



**Fig 1: the participant tastes chutney (a), points (b), extracts money (c), puts away purse (d), takes product (e) and retrieves AR tool (f). Note the fiducial marker visible in 1a.**

### Ubicomp tools to support shopping

Work at Limerick (Ciolfi et al 2005) targets a market to examine the situated nature of interactions. They note that with social activities, a careful approach is required to bring in digital tools to conserve and enhance them. Heath et al (2009) explore an intelligent gavel, linking internet bidders more dynamically into the action at live auctions. Other designers of ubiquitous computing have also begun to consider retail: exploring the impact of a dynamic map on retail (Meschtscherjakov et al 2008); an interactive mannequin to increase browse time at shop windows (Reitberger et al 2009); and robots that distinguish shoppers from passers-by (Kanda et al 2008).

### Marketing

Marketing theorists have increasingly understood retail in terms of experience(s) and also now stress the extent that consumers co-construct them, activating the resources that different marketplaces provide to create meaning

(Cova and Dalli 2010). Four stages to consumption are often identified (2010:477):

- pre-consumption, including: searching for, planning, day-dreaming about, and imagining the experience
- purchasing, including: choosing the item, payment, packaging, and the encounter with the environment
- core consumption, including: sensation, satiety, satisfaction/dissatisfaction, and transformation
- remembered consumption: when photos, movies, and other memorabilia are used to relive a past experience.

By separating the stages of the shopping experience and discussing them in terms of before, during and after shopping (and before, during and after consumption), we have the beginnings of a narrative view of shopping. We can see that moments might combine into a discernable whole that can be understood as more than the sum of the parts and where stages come predictably. We can begin to detect the nature of *going shopping*.

### EXPERIENCES AT THE MARKET – THE STUDY

We attended a farmers’ market in a shopping street in a southern English town during several sessions over the course of a few months. Most stalls were present each time we visited, staffed by the same people. A feature of the market was the charisma of the stallholders. There was something of Gregson’s spectacle (1997); for instance, busking musicians usually performed. The Common Cause Co-operative (CCC), which runs the market, describes it thus: “where farmers, growers or producers from a defined local area are present in person to sell their own produce direct to the public. All products sold should have been grown, reared, caught, brewed, pickled, baked, smoked or processed by the stallholder.” ([www.commoncause.org.uk/](http://www.commoncause.org.uk/)). Technology use in situ is low – uncooked meat stalls must have refrigerated displays but there are no electronic tills, lights or signs.

### The technology to be deployed

As with many trials in deploying technology, the technologists involved already had a type of tool in mind when they set out to explore what kind of applications would work in a farmers’ market. Specifically, they intended to connect physical and virtual worlds using an augmented reality system that would allow shoppers and traders to specify who they trusted and prioritise material visible to them based on trust values (see Wakeman et al 2010 for discussion of the workings of the technology).

Using this AR system by glancing through a screen could show data accessed from a web server as an augmentation to the scene at the market. Accessing this data is triggered by pointing the device at a large symbol (a fiducial marker) that the system recognises, positioned in a key location. (The same effect was achieved by taking photos of QRcodes -ISO 2006- on high-end mobile phones in some tests.) In the system being tried out, it was possible to write comments as well as view those that were called up by the symbols, so that viewers could read messages that had been attached to the location by other people at different times. Behind this was a further facility that allowed people to rank authors of comments more or less highly according to how much they were trusted. In other

words, this mechanism could be used to prioritise the display of comments from friends, stall holders and/or familiar organisations and bury spam and other less welcome messages, by shrinking them or showing them less prominently (see Wakeman et al 2010). Our design question was then whether we might incorporate this into the market in a way that it added value and avoided detracting from positive experiences.

We used large distinctive markers with black borders to act as anchors, ensuring easy recognition by the software. We attached these to market stalls, at eye level where possible, so that users could focus the devices easily on the patterns and retrieve comments. But how we deployed markers (fig 1a) and the comments they enabled users to retrieve/post was decided by the results of the study we conducted, detailed below, and a description of the design follows our explanation of what we learnt and how.

## METHODOLOGY

The techniques used for data gathering were chosen to answer the questions: What is the shopping experience? Which aspects are fun and could be affected adversely if augmented? What might the tool add? Therefore, we situated informants in the experience being researched and helped them reflect on it. Though not ethnographic in the way of Sherry's work, our process also differed from the survey or interview. We used accompanied shopping (eg Morrison et al 2003) to elicit shopping behaviour and to allow our researcher to observe encounters between our shoppers and others directly. We looked at shopping both as experienced in situ and as told in reflection, collecting a think-aloud account given during shopping; then a debrief. We used these sources for judging the intersections between people, information and things that would be significant for our design.

We increased recall in situ by asking for elaboration of choices, and in reflection with questions such as 'And then what happened? And then what did you do?'. Zizek comments: "If - accidentally - an event takes place, it creates the preceding chain which makes it appear inevitable" (2009). Since we were not enquiring into how memory works, but looking for key intersections, this useful tendency of hindsight to help us see shopping as a coherent activity with beginning, middle and end was not considered prejudicial, but rather a way of judging how moments of intersection worked in the whole. We tracked moments (fig 1), but their significance appeared in the broader structure. We viewed our participants as involved in a first person narrative which we recorded and analysed. Narrative also forms the basis of personas and scenarios (Pruitt and Adlin 2006) and working with stories in user testing (Quesenberry and Brooks 2010), but we distinguish our approach, using it simply as an organising principle for exploring intersecting experience, rather than as a source for constructing stories later.

## Sample

We chose four local shoppers (H, In, K, W, including one couple who shopped together, H) who like markets and shopping, who are articulate, confident of their opinions and fairly competent with ordinary technology like

phones. While the first three factors were discernible in an initial brief interview, the last was self reported and corroborated in the field. Within this group, we noted variation in their priorities: some liked cooking, others food more generally; some were concerned with buying local, others less so, etc. Since we were testing a tool which we did not want to interrupt the best aspects of shopping, it was important to us to work with participants for whom food shopping was a pleasure, and who would be able to articulate the experiences they were having.

## Analysis

As noted, there are many aspects to shopping, from the experience of arriving at the scene to anticipated relations with goods after leaving. We chose the following aspects on which to focus our analysis:

- Points of interaction: shopper/stallholder, shopper/other shopper, shopper/objects.
- Experiences that reportedly gave pleasure, and any ensuing disruptions.
- Stories told and the use of the information revealed.
- Indications of trust in stallholders/other shoppers.

Using these emphases to guide us, we analyzed the recordings (and the transcripts made of them) and examined the visual material we collected. In the first phase, we used it to inform the designing. In the second phase, we used it to evaluate the design.

Having collected our data, we identified narratives and also the trajectory of information and objects within them. So, for instance, we would look at what happened to the shopping bags as the shopping progressed. Having tracked the appearance of other people and things in the narratives, and how they interacted, we shared findings in the technical team. The section below outlines our findings, with quotations from accounts given in italics.

## Data gathering

There were several stages to the collection of data:

**Discussions with co-ordinator and stallholders:** These interviews were as much to brief stallholders and solicit co-operation as to collect data. We spent time with stallholders explaining what we were testing and why, encouraging them to supply us with their marketing materials, building interest and gaining permission to display fiducial markers/QRcodes and collect data.

**Incentive:** Each participant was given £25 to spend to reimburse them for their time. The money ran out before they had bought everything they were interested by.

**Accompanied shopping (AS):** The same interviewer shadowed each participant for the duration of their market visit (AS-1) and then conducted the reflective interview (AS-2). At the start, we requested that the shopper give an account, using the interviewer as a foil for comments, as a potential source of answers to questions that occurred to her and as the recipient of a 'think-aloud' tour. This interaction was recorded as audio, and included all encounters, such as hearing other shoppers or chatting to stallholders. Moments of encounter with people and objects (such as bags, money, goods, phones, etc) were photographed. After shopping, the shopper went straight

on to reflect on the shopping tour. Just as the think-aloud tour took the market as a stimulus, so the reflective session was supported with questions and the use of photos of stalls as an aide-memoire for points on the tour.

**Developing applications:** After talking to stallholders and listening to the stories of shopping, the team created two applications for the tool (in the two versions: PC-based AR and phone-based QRCode) for testing in the market. (Details and the rationale for them are below.)

**Accompanied shopping using tool (AT):** Two shoppers who did the first tour came back to a later market to use one of the applications and two new shoppers joined us fresh to try out the applications. In all cases, the same process was used to interview the shopper, but questions in the second series emphasised evaluation of the tool.

### OBSERVATIONS OF SHOPPING INTERACTIONS

We observed several common shopping behaviours. The following sub-sections are derived from analysis of transcriptions of audio recordings and observation during the accompanied shopping. They feature particularly those aspects we deemed to have given pleasure, based on the valence of descriptions in the accounts.

**Beginnings:** People come to farmers markets often without knowing exactly what is on offer, how the market is laid out and so on. All the shoppers surveyed the market to get its measure: walking through to savour experiences to come, assess the range of produce and decide where/how to progress. *Can I just wander round and look at everything first? (K, AT-1)* and: *I'll walk the other way and take a much deeper look. What I often do, if I've got somewhere I really want to look at, I often delay it, I save it up rather than rush to it, to spin it out a little bit. (In, AS-1)*

This 'pre-consumption' activity did not involve specific planning. Instead, the shoppers approached the market with a mix of loose intentions (getting chutney to supplement what's at home; finding something to please a partner) and situated inspiration (getting venison because it was available; buying cheese after trying it). *I really really enjoyed that, just nosing around and having a look. (In, AS-1)* and: *I would scan and I wouldn't buy the veg until I'd bought the meat so I'd have an idea what to go with it. (W, AS-1)*. Limited budgeting behavior was also evident; the incentive acting as the money to dedicate to purchases. While altering the amount to hand, the incentive did not appear to change practices: there was 'housekeeping': stretching the money out and trading off between items.

**Other people:** Another positive feature was contact: *My self-esteem has gone up through having a conversation that we're both interested in" (W, AS-2)* and *It's about the relationship with the stallholder and they are practiced at engaging and judging somebody. I was being quite chatty and they were happy to go along with that. (In, AS-2)*

These encounters were congenial; all four shoppers relished the inspiration that these contacts with others provided in deciding what to buy. Recordings show others enthusiastically endorsing products whose quality

they appreciated. In some cases they made a point of telling the stallholder that they had returned to make a repeat buy. Shopping, in this respect, can be seen as a collaborative activity not only with those known to the shopper, but, at the point of assessing goods, by the deliberate courting and/or appreciative reception of input from others present. *He prompted them to say something and they were... quite spontaneously enthusiastic. And really pleased to say how much they liked it and saying ...that they've moved and that they came back specifically to this stall. ...Anyone who can build a relationship with his customers like that must be worthwhile. (In, AS-2)* or: *French people think this is good food: that must be a recommendation. (W, AS-2)*.

A noticeable trend was to solicit information as part of striking up conversation at purchase, not the other way round. Interestingly, W did not ask for information about her choices before buying, but afterwards. Unlike others, who, if they engaged the stallholders in dialogue, did so as part of choosing what to buy, she used the act of buying as an opening to talk to the person behind the stall and then learn about her choice, building relations and informing the subsequent use of the product (W, AS-2).

**Products:** A further activity was trying the small samples made available on stalls to demonstrate flavour and quality. Observing samples and anticipating their role was a highly significant moment in accounts, quite as significant as actual sampling: *It's something about having little bowls of things out: "just try it": there's no commitment. It feels very generous. "We want to share it, we want to hand it out to you"...this encouragement to just dip in and taste things. It gives a sense it's his own stuff, he made it so he can give it out and you get a sense that it's a privilege to be sharing it. (In, AS-2)* or: *Even if it's just the opportunity to taste them... (W, AT-2)*

People saw the people and products together, setting the tone and creating the environment: *The first thing that you look at is the product and you see these gorgeous yummy things laid out. And then when the person behind the stall is enthusiastic about them too and tells you stories... (In, AS-2)*. There was much other interaction with objects, but whereas the samples caused comment and pleasure, the presence of other objects, such as phones, bags, etc, while part of manoeuvres in performing shopping, did not feature in comments until the tool was added in the second round of interviews.

**Endings:** The shopping ceased after the shopper had explored the length of the market, chosen some items and, in most cases, gone back to buy them after examining all the options. Underhill (2008) notes when the hands are too full, shopping is over. The smallness of the market set a parameter, as did the budget: there seemed a natural exhaustion point when the shopper lost interest, turned to the researcher and suggested they had reached the end.

### Narratives of the Market

Seductive stories of local doings permeate the market, from the blurb on the CCC website: *Fruit and vegetables sold at a farmers' market will have been harvested the day prior to, or even on the very morning of the market...*

to the producers' and shoppers' tales: *I'll tell you a little story about how I came to work for them. I went to a charity event and bid £27 for three pies. I bought them, put them in the fridge, ate them, they were so nice, and I phoned him up, went up to the farm, been buying off them ever since, and eventually he says 'What do you do at weekends?'*. (pie stall, W, AS-1).

Hearing stories of production made a big impression on the shoppers. If we take one interviewee and look at the way she (In, AS-2) reflects on her impressions we can trace a process useful in assessing market interactions and their value. And although we cannot automatically generalise by scrutinizing one person's account, other accounts corroborate the importance of what she reveals: *They've got really good stories: so it's either genuine or they've been well primed. It felt like you'd sat down next to them in a pub and you'd got chatting, rather than sales patter... that genuineness is a strong part of it. ..[I] feel that I've learnt a lot about people in the area and the community of food production that's out there.* (In, AS-2)

She builds on the producers' stories to construct her own: *One has this vision of a wonderful 1920s farm kitchen. You want it to be like that, but it's probably not. You would like it not to be some industrial processing centre, so I was trying to work out where this food might be on that sort of scale, from jolly Mrs Beeton kitchen to the other end: some dank neon-lit warehouse. I'm now imagining everything is a jolly family business.* (In, AS-2)

We can observe her romanticized version of production and her yearning for it to be true in tension with more ironized language acknowledging this tendency and other possible realities behind the scenes. But, despite some scepticism, she is beguiled. When she describes purchasing, it is no longer a transactional event; it is an exchange of gifts. It is money given in gratitude (Lawson 2010) that he is providing food with this provenance, that she is allowed a share in this less industrialized way of living and that she has been made to feel good about her shopping: *It makes it feel less like a transaction: less like 'I'm coming to purchase your goods' and more like 'Ooh, you produce lovely stuff. Isn't that nice? Can I have some?' 'Why don't we exchange some money and you can have some.' It feels a lot more friendly.* (In, AS-2)

She has earlier called access to tasting samples 'generous' and talked of the privilege of sharing them. All the interviewees agreed the tales had an impact on trust. For instance, none of the shoppers we accompanied asked about ingredients, but, when questioned, all said they took it on trust that the contents would be as wholesome as they wanted to think. The tales enhance the visual aspects of the produce display to suggest trustworthiness.

So producers' and others' stories add considerably to the experience and become an event in themselves, building relations and trust as well as sharing information. How the stories are told is important: not just as 'sales patter' but like something one might hear in the pub. Elsewhere, another shopper (W, AS-1) demonstrates the importance of personal attributes: flirting with and quizzing the man with the venison, rather than the other butcher, because he

is 'sexier' (W, AS-2). This sharing of stories and the opportunistic nature of the contact and content point to both opportunities and incipient problems in developing a tool: there is an important flow of information that can be augmented, but at the same time, it is situated in a vulnerable place, at the heart of face-to-face emergent and embodied interaction. The flow involves valuable data about the goods for purchase, but it is demonstrably not only offered and used to aid decision-making.

## DESIGNING THE APPLICATIONS

As can be seen in looking at shoppers' behaviour, above, it would be possible to offer shoppers a tool to support planning what to buy or balancing the budget or to give information on the territory, pointing to stalls to visit and what is on sale. It could include automatic recommender systems for goods (eg Nichols et al 2008, whose tool searches data, such as competitive pricing across the web, at point of purchase). But the information that seemed valuable took its shape out of incidental communication: the stories told of production, preparation and pleasure in consumption. This was shared producer/shopper, shopper/producer and shopper/shopper and acted more like glue than data. Only some sharing occurred through direct interaction; much also came from 'listening in' on others. As people watched the spectacle of selling from around the stalls or waiting in the queue, they were honing their judgments about what to buy through listening as well as observing, discussing and tasting. But they were also forming judgments about people and environment.

Thus, there seemed to be a distinct moment to intervene. Physically, this point occurred when shoppers approached a stall to examine goods or queue and were ready to engage. This consistency enabled us to attach data to particular stalls by fixing markers to them and working with one stallholder per set of contents. Experientially, it came in weighing up purchases or confirming a selection. Whether sought before or after exchanging money (and W did most questioning after purchasing, as noted), stories affected morale, satisfaction, planned use and the memory of the event as well as the buying decision.

In the words of the technical lead on the project, these findings were 'sufficient to persuade the team that our initial design ideas were wrong, and that we needed to focus on how to support conversations rather than provide decision support tools' (Wakeman, team notes, 2010). So, we conceived the application of the tool to provide 'listening in' as a stimulus for engagement.

## Whose stories? Whose voices?

To learn more about how shoppers 'listen in' and what might act as a stimulus, we experimented with two sets of voices in our applications. The underlying technology of the tool allowed us to prioritise information from trusted sources. As a default (and a courtesy), the stallholders were set up as most trusted source in an application we called *AskUsAbout* and which held news and information about a stall's products. We made this a marketing tool explicitly and, by being explicit, hoped to avoid the mistrust and scepticism that 'persuasive' tools can arouse.

We had also witnessed alternative sources of information that were as entertaining, and potentially more customer-focused than that supplied by producers. Other shoppers' stories had acted as a source of delight and suggestion, particularly from those known to the user and/or whose preferences were known. In the absence of independent reviewers, this source might come to be highly trusted, as with recommender sites and user reviews. For this reason, we made a second application, *VisitorBook*, to which everyone could contribute their opinions and anecdotes.

Separating the two functions – to encourage realtime interaction with the trader and to offer asynchronous interaction among shoppers – allowed us to avoid some politics of deployment (by simultaneously making producers' information trusted and distinct) and to draw attention to the subtlety of behaviours, described above, that support the development of relations in the market. Being clear about these distinctions, we hoped we would be able to offer a tool that was itself trusted by shoppers, even if individual posts attracted ranging degrees of trust.

**AskUsAbout:** As the name suggests, this application was conceived as a means of stimulating dialogue between the producer and the shoppers at the stall. Placed near the point of sale but set back from the counter, it showed information when users pointed their mobile device at the code/fiducial marker. A talking point for shoppers as they reached the front of the queue, it alerted them to new or unusual stock to ask about or order. For instance: *We have pet mince and free bones available. These are excellent value and really loved by dogs. Just £1.50, with reduced prices for regulars.* In this way, it would not replace either banter or banners, but prompt conviviality.

**VisitorBook:** By contrast, the visitor book was intended to be a space for customers to share experiences across time. Comments left by shoppers could be read by later users, perhaps marked as known, unknown, trusted, etc. In this way, recommendations of the kind that shoppers interacting at a stall might share are preserved. For instance: *We had some pork chops from David back in February, and they were delicious. Not only did they have the porkiest taste ... they were cut so large that they were almost a roasting joint in their own right.* Located similarly by the stall, we anticipated that the effect of *VisitorBook* would be different from that of *AskUsAbout* because of the different source of information.

## EVALUATING THE TOOL

Messages displayed by the tool were greeted warmly by all four shoppers. They liked the idea of the messages and their location at the stall. This was especially true for the visitors' book, and those who could write comments on their device tried it out. However, since we were working with material from stallholders and shoppers, it is important to observe that interest in one application rather than another might relate to the quality of content, not the type of author. Another factor affecting interest would be relevance to individual customers: we did not control for this or for the number of postings.

## Marketing – message and impact

Shoppers reported that they changed their shopping as a consequence of material that came through the tool. Two participants said they chose to try different food, inspired by a comment about pork chops in the visitors' book: *I would, I think, have bought chicken or sausages because that's what my son likes to eat, but the fact that the kit mentioned pork chops made me think he really likes pork chops and I don't very often buy pork chops (K, AT-2)* and similarly: *It's good, if I go to that [the application] first before looking at this [stall], then I'm immediately drawn to the pork chops, which is something I wouldn't normally buy... I suppose this is really good marketing (H, AT-2).*

H reasoned that that the application worked because it was: *A review at point of use, which you wouldn't normally get in any other way. (H, AT-2)*, suggesting the peer-to-peer factor was persuasive. But accounts show that specific author is also significant, as is the time they left it: how recently, before or after eating it. K recognizes the author of one story in the visitors' book and finds this inspires extra trust: *I knew who that was from, yeah, so I guess I responded quite differently to that...I'm convinced by that. (K, AT-2)*

The *AskUsAbout* function had less direct impact on buying, but did offer a resource for discussion, with evidence of some potential to develop impact, not least if the stallholders get interested in putting up material.

## Interfering with interaction – logistical, social

However, there were costs to using the tool. If the tool was held in the hands, especially the tablet PC version which required both hands to hold it, it effectively took over the space of interaction for goods and money (fig 1). All the physical negotiations we had watched in the original tour of the market, involving bags, new goods, tastings, bought goods, purse (wallet), extraction of money and payment (fig 1a-e) were now aggravated by another component that had claim on the hands during buying. Shoppers developed management strategies (fig 1f), such as placing tool and bags on the stall during transactions. Where there was no stall on which to place the tool while buying, the inconvenience was more palpable. Further, the tool required that hands to be free at the point of use, so bags had to be accommodated as purchases grew: *I'm finding it quite cumbersome at the moment. (K, AT-1).* The couple shared use of the tool and were less inconvenienced – as might be anticipated.

Another, more insidious form of interruption occurred. The presence of the symbols informing the shoppers of the augmenting information created a low grade pressure on them, akin to the 'pull factor' of labels in museums: *I didn't notice the name of the vendor. I'm focussing on this rather than anything else. (K, AT-1).* Although this might have been an effect of their status as testers, they did check the information at the expense of other activities that might have ensued at this point. Looking at the screen diverted their attention from the immediate scene and could act as a barrier as well as an enabler between sales staff and shopper. Whether it was a support or interruption seemed to be a matter of timing: if the shopper was queuing, it had less impact on the exchange

with the stallholder, though it could still impact on relations with other shoppers. A couple of our shoppers talked less, despite more fuel from which to initiate discussion. This was in part a factor of using something new; we need to investigate the extent to which new-tool logistical issues led to interactional issues. Accounts show use did become easier as shoppers became accustomed: *It didn't feel like a difficulty at that stall. I mean, I guess that was the third stall that I'd bought something at... Because that was the, the one stall where I didn't need to, I didn't think about it.* (K, AT-2). And it was noticeable that the phone was easier to use, both in terms of size and familiarity with type of display.

We recognise that using the applications will play out differently with different shoppers. Some who might never talk to a stallholder could benefit from information available in this alternative format, or be inspired to ask a question as a result of reading it. However, augmenting information could be achieved with a banner or card; we were intending to augment *interaction*, not suppress it. Where we distracted people, this was a partial failure in our attempt not to disrupt existing practices and pleasures.

Commenting on technical design issues is beyond the scope of this paper, but we recognise a number of them, such as getting the AR function onto a popular phone and coping with the variable external conditions of a market, such as glare on the (laminated) fiducial markers.

## DISCUSSION

Our trials with the applications raised many questions for us. We placed mini-narratives (*VisitorBook*) and cues for eliciting further narratives (*AskUsAbout*) in front of stalls at the point where the stories of the market intersect and people meet, talk and 'listen in'. This is also the point where many of the juggling activities involved with stuff in the hands take place. If the tool is to act as a prompt for discussing and commenting, it needs to be positioned just before engagement, rather than, more disruptively, during it. Understanding the situatedness of people's practices as both physical and experiential appears useful as an approach and can be built on. For instance, we can ask when shoppers are most likely to post contributions: as part of (repeat) purchasing, caught up in the enthusiasm of the interactions around them, or in the 'remembered consumption' phase, posting from home after cooking and/or eating? How can it become part of the shopping?

Posting in the market is a 'cumbersome' activity - more so than reading or chatting - but might be undertaken while queuing. Posting at home could be supported easily online, but would anyone bother? Would they know how to: away from the stall, with the wrapping thrown away? The enthusiastic endorsing that we witnessed gives us hope that people would add testimonials as part of the warm, even grateful, culture described by our shoppers, but how far does the remembering extend? Could extra value attach to the goods through this later de-situated activity of sharing reflections and exchanges with others? Or is out of sight also out of mind?

There are many social and practical barriers associated with adding content, while for the tool to be effective it

requires shoppers and stallholders to provide material regularly. We watched our shoppers try out the posting function, but this was just their first encounter with the tool and nothing can be taken as indicative of whether they would post in practice were they to use it for longer. Meanwhile, users want visible assurance that comments are fresh, traceable to an author and relevant to the current product and to the person buying it. There is no room here to discuss ways of ensuring this, but it is a major factor in the ultimate success of this kind of communally generated information tool (Light 2010).

Another dimension to consider over the longer term would be the play of trust in the applications and beyond. The tool can show contributions differentially: it can make postings bigger or smaller, change their colour and so on, based on who wrote them and how the author is trusted by individuals/groups using the tool. Again, to what extent would users do work to exploit this? Would they join groups and indicate trust relationships? Would they be willing to articulate their faith in some sources and not others? Would it prevent spam reaching them?

The way we engaged shoppers in this study did not help us evaluate this. As with many other aspects, such as shopper/shopper relations, only a longterm study would offer an answer. The accompanied-shopping-with-tool gave insight into immediate disruptions and influences, while hinting at possible impacts and effects. It raised questions for further study, functioning as a probe, rather than a prototyping device. The comparisons of *before* and *after* suggest that gains include a sense of remote-presence between shoppers who have enjoyed the same activities, but that the cost is more paraphernalia and a new physical and experiential obstacle to contend with. A planned use study may begin to give us real answers about impact on dynamics, relations and environment.

So, while the shift in thinking about the nature of what our applications might augment was exciting, we, unsurprisingly, identified challenges in focussing upon a market. These would be interesting to pursue as we try to understand what ubiquitous computing technologies like AR could offer in low-tech and unmediated social contexts. The tool relies on mobile technology and a remote central server to store messages: nothing is based in the market. This lightness of approach might make it suitable for use beyond the immediate environment of UK farmers' markets; but only with good embedding.

Finally, we reflect on how the technique employed made a contribution and its strengths and weaknesses. First, it must be noted that the fast production of context-specific qualitative data was important in influencing the designs. Although designers may start from the social context, more often technology is developed by a team with an application in mind. In this case, the focus changed after the first tranche of research from data-orientated solutions to an interaction-orientated outcome as the technical lead's understanding of shopping in a market changed. The value of user research to development is well understood, as is contextual enquiry. The emphasis here on narrative and following the flow of experience and objects through this, is a development of contextual

enquiry beyond task, into the realm of experience. We asked experienced shoppers to respond to a particular shopping environment by shopping in it. The dual activity of shopping and giving an account worked well in capturing things as they happened, and directing the interviewer to focus on the same issues as the shopper and ask questions while events were fresh. It had the overall weakness of interrupting 'normal' experience. The damage this might do to a particular enquiry has to be assessed, depending on the purpose of the data. Here, we would suggest, it did no more than shopping with a friend might, although a highly inquisitive friend. The enquiry emphasised encounters with other people, information and things. It did so to understand the social aspects of shopping, and, along with the reflective interview, it was effective for this. However, although this technique has potential in fields, such as transport, where mobile ubiquitous tools are being developed and objects, people and information intersect, its use will be strongest for gregarious contexts, where talking is natural and stories are part of the fabric.

In conclusion, in giving an account of designing AR tools for a market we have shown how information can become a currency to build relations rather than make shrewder purchases. In the accounts of exchange of money for what Sherry calls 'cultural biographies' (1990) and our shopper calls production of 'lovely stuff' (In, AS-2), we see a commerce that manifests in contrast to the streamlined utility of online buying and celebrates its difference. While groceries have a physicality that makes them intractable to some new practices emerging around digital artefacts and exchange, we can see a similarity in the consumer quest for authenticity and individuality. This can be met by forming association with people they see as offering it (Lawson 2010). AR tools have the potential to integrate, acknowledging embodied aspects like tasting, flirting, sizing up and feeling produce. Perhaps the most important question we can ask is why people are using a cold and windy venue to do their shopping, with choices constrained by the stalls booked and what producers offer, when, quite clearly, they do not have to do so.

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