

Mobile Value Chain and Services

The Case of Mobile Donations for Charities

Seyed Mohammad Adeli, Silvia Elaluf Calderwood, Claus Oskar Heintzeler, Javier Huerta, Caroline Legler
Department of Management
London School of Economics and Political Science (LSE)
London, United Kingdom
E-mail: heintzeler@locaid.org.uk

Abstract—This case study shows how the use of mobile digital services through smartphones can enhance known value chains of services by increasing the lateral margin value. The particular case discussed relates to a mobile application for charity organizations, i.e., non-profit organizations with the intention of providing help and raising money for those in need. The paper is of relevance for researchers and practitioners, as it demonstrates how computer and business science can be linked to analyze human computer interactions, which may help to solve problems in existing business processes through the use of mobile technology. Based on empirical data gathered from research and interviews during the case study, the paper identifies the most prevalent problems of charity organizations, such as lack of awareness and information, trust, transparency and convenience, and demonstrates how mobile technology can support these deficits in business processes and service value chains.

Keywords—mobile technology; charity; value chain; value added; location services; mobile design

I. INTRODUCTION

Mobile technologies have been widely studied by both academics and specialists in terms of how their use has changed everyday life in today's society, and also the enterprise relationships between companies and their employees [25]. In recent days, the increase in the availability and popularity of smartphones, like the iPhone (2007) and Android devices (2008), has raised the need to direct attention to re-evaluating the role which mobile devices can play in the delivery of digital services. In this context, mobile devices have changed established value chains and are able to co-create or add value to them.

This paper focuses on analyzing the use of mobile technology associated with smartphones and its ability to add value to the known value chain of charity services. The paper will, firstly, review some of the fundamental theoretical and practical aspects of general value chains for organizations, the value chain for service industries and the value-added possibilities of mobile devices. Next, these established concepts will be customized for the charity service industry on the basis of research and an empirical project, and the development of a smartphone application

called “LocAid”, which exploits the corners of the charity value chain and creates added value to charities' services.

Finally, the paper will analyze such enhancements in terms of design and provide a set of recommendations which can be used for both defining what value is added to a known value chain when releasing smartphone applications and for the design principles which are required for such development. The paper will finish with the limitations and research directions for further investigation.

II. THEORETICAL BACKGROUND: VALUE CHAIN AND MOBILE TECHNOLOGY

The general concept of the value chain serves as the theoretical model of this paper. In the following, the basic concept will be introduced, its adaptations in the service sector described and the effects of mobile technology identified.

A. The Value Chain

The theoretical model of the “value chain” is first mentioned by Michael Porter [20] in the discipline of strategic management, linking innovation to corporate strategy [17]. It describes how internal activities are developed inside a firm through different steps, which form an economic process, from manufacturing and raw materials to the distribution of the built product.

Porter [20] proposes that a firm can create a cost advantage by reducing the cost of individual value chain activities or by reconfiguring the value chain itself. The concept distinguishes between primary activities and support activities. Primary activities refer to the physical creation of the product, through design, construction, sale and post-sales services such as inbound logistics, operations, outbound logistics, marketing and sales and service. The secondary or support activities help to improve the effectiveness of the primary activities and Porter identifies four main types: procurement, technology development, human resource management and infrastructure [2].

Porter's concept of a value chain is used to model the full range of activities which are required to bring a product or service from conception, through the different phases of production, delivery to final consumers and final disposal after use [12]. The importance of the concept derives from

the fact that it draws attention toward activities which “add value” to the final product or service [12]. It is considered relevant for seeking competitive advantage, reducing costs and identifying ways for differentiation.

Some authors, such as Altenburg [1], argue that the strongest advantage of Porter’s model is that it takes into account differences across organizations, suits multifaceted, multidivisional firms and provides information on a firm’s strengths and weaknesses. On the other hand, its main limitation is that Porter focuses mainly on products, thereby neglecting services, and only takes into account the internal strategic analysis of an organization, not the external one (industry, customers, etc.), leading to an incomplete analysis of competitive advantage.

B. Value Chain for Services

One limitation of Porter’s value chain, as mentioned earlier, is that it does not highlight the importance of exploring new dimensions of the concept, focusing on services, in particular digital services, rather than products. A service approach would give an insight into the flows and transformations by which value is added and might be of great relevance when analyzing service organizations.

One of the main characteristics of services is that their production and consumption happen at the same time. Hence, the service production process itself is the product and, due to the contribution of consumer value, it is more or less co-created. A further characteristic of most services is that, unlike products, services are activities, which are abstract rather than physical and, therefore, are often intangible and impossible to stock. In addition, they are perceived subjectively, making them difficult to evaluate, and factors such as experience, trust, feeling and security play an important role [18]. Based on these characteristics, Gabriel [8] proposes a value chain framework customized for services, as illustrated in Fig. 1.

Primary attributes

Service design:

The value of the service needs to be incorporated into the service design. Service designers need to conduct market research and try to be as innovative as possible.

Knowledge management:

Knowledge management refers to the service provider’s knowledge about the needs and dynamics of the decision-making process of customers as well as the customers’ knowledge about the service.

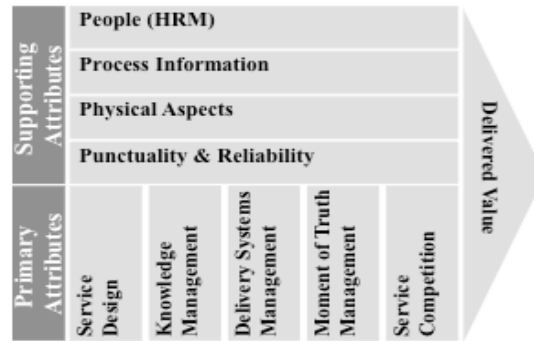


Figure 1. Service value chain, Source: Gabriel [8]

Delivery systems management:

Services cannot be stored for future use or separated from the provider; this means that services are perishable and inseparable from delivery. Good management of delivery systems increases the convenience for customers and thus improves their perceived value.

Moment of truth management:

The encounter between service provider and customer in the actual moment of delivery of the service can leave a positive or negative impression in the customer’s mind. It can build or destroy trust and confidence and can dictate buying decisions for the future.

Service competition management:

Customers have a choice between different competitors. Therefore, providers need to stimulate their clients even after the service delivery. Efficient after-sales management and a high quality of service can increase the perceived value of the service.

Supporting attributes

People:

People are important in the co-creation of value due to the simultaneous use and production of services. Customer expectations need to be matched with offered service to prevent a perception gap.

Process information:

The service provider and their employees need to be aware of their service processes and the generation and delivery of the service value. Transparency and the availability of information, through, e.g., IT, are of great importance in this step.

Physical aspects:

The physical aspects refer mainly to customer services and also include tangible aspects like the office’s appearance. Accompanying the customer in his preferred way throughout all primary activities and signaling the

value of the service throughout this process is, therefore, crucial.

Punctuality and reliability:

The time aspect is significant in the service industry and relates directly to the service quality. Reliability implies a level of consistency and assurance for the customer.

In a similar framework, Nootboom [18] attempts to develop a generalization of Porter's framework, corresponding to different types of service industry. This industry differentiation, based on the central features of the value adding process, is believed to enable easier identification of sources of inefficiency, to detect opportunities for value added and to be crucial for increasing transparency.

The research question this paper seeks to answer is: how can mobile applications, through carefully crafted feature design, enhance different steps within the service value chain? The model described above is used as a theoretical framework for the purpose of this study, since it offers a more viable perspective than Porter's original framework.

C. Value-Added through Mobile Technology

Mobile technologies and, more specifically, mobile applications have unique attributes which can add significant value to a company's service value chain. The literature identifies, in particular, three features as fundamental supporters in today's business:

Connectivity

Connectivity or mobility refers to the interdependence of time and place. A wireless infrastructure offers "anytime, anywhere" communication and information exchange [4]. It is especially valuable for time-critical or spontaneous needs [14] and it is useful to employees and customers alike in that mobile services provide both user groups with easy access to the most up-to-date information [3, 13].

Personalization

Mobile devices are typically assigned to single users, who can then personalize the interface and application settings of the devices [4]. Especially for interactive and dynamic mobile services, personalization or customization is fundamental for supporting user satisfaction and the efficiency of a system, according to Barnes [3] and Coursaris et al. [4]. Moreover, mobile technologies support an easy modification of content, the repetitive and simultaneous consumption of information by different users and fast and cheap reproduction [3].

Localization

The Internet has the ability to localize specific places (e.g., IP address). Mobile technologies can extend this localization feature by also localizing users (e.g., a mobile worker) and items (e.g., tracking a shipment) [4]. This

feature is strongly demanded, especially with respect to today's development of mobile applications.

The identified attributes can be very valuable throughout different stages of the service value chain. They can play a significant role in service design, knowledge management and delivery system management. Moreover, mobile technologies are able to assist all supporting attributes (people, process information, physical aspects, punctuality and reliability) of the value chain.

However, while improving the connection between the customer and the company, some problem areas may arise. As Gabriel [8] argues "the more convenient the system, the better the perceived value by customers". This points toward the need to give crucial attention to ease of use and the perceived usefulness of the mobile device in order to ensure that customers do actually use the device, that is that they engage in the "cognitive effort" [4, 13]. Moreover, privacy and safety in information exchange [4] are often perceived as risks in mobile services. In particular, customers can lack trust in monetary transactions in mobile commerce and, therefore, these should be given special focus in the service value chain.

III. MOBILE VALUE SERVICE FOR CHARITIES: "LOCAID"

In order to illustrate and understand how innovative mobile services might add value to established value chains, this section studies the case of the mobile application "LocAid" in the context of the charity industry. It shows how LocAid's specific design features, identified in market research and in interviews with charities and the charitable society, can add value to the value chain of charity services. Firstly, the general process and work of charities will be described and a framework for a charity value chain proposed. Following this, the LocAid project itself will be introduced and its effects on the value chain illustrated.

A. Charities and their Value Chain

A charity organization can be defined as a non-profit organization with the intention of providing help and raising money for those in need. According to the Charities Act of 2006 [26], charitable activities include, among others, support for health care, poverty prevention, community development and environmental issues. These activities range from a local to an international level. To finance their work, charities rely mainly on external funding. Individual donors constitute the main source of income, followed by charitable trust grants, fundraising initiatives, asset investments, trading subsidiaries and charity shops [26].

The general relationship between charities and the beneficent public, and the basic charity operations required to pass public resources to those in need, is illustrated in Fig. 2.

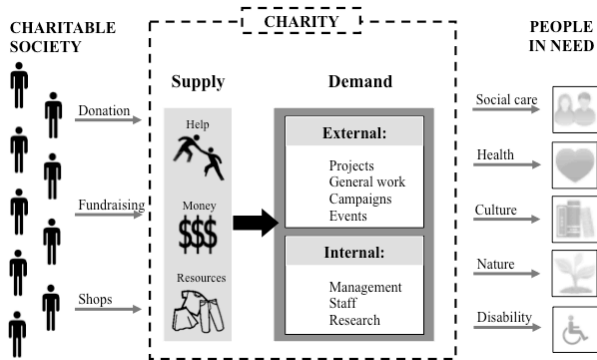


Figure 2. Charity process, Source: own illustration

This shows that charities may receive financial, human or physical resources from charitable citizens through a range of activities. These activities can be broadly categorized into donating, fundraising and giving to/buying from charity shops. The overall supply of resources is then used to support the external and internal demands of charities, such as the funding of specific campaigns and the management of the organization, in order eventually to help people in need.

The activities of donation, fundraising and charity shop use, with which people can engage, are rather diverse. Fig. 3 depicts the different ways of contributing within each category.

The first activity, **donating**, is the process of giving money to a specific need. While charitable people can donate on a one-time or regular basis (single/regular donation), they can also make donations on behalf of somebody else (gift donation) or based on their own will (legacy).

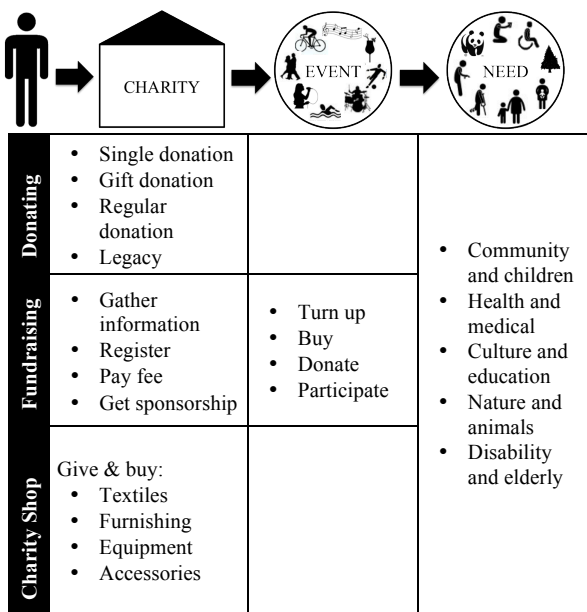


Figure 3. Activities with which charitable people can engage, Source: own illustration

The research for the LocAid project revealed that most charities do not specifically state to whom/which organization their donations will be given. Many charity websites did not show which particular projects they operated and remained relatively inexplicit about the general work they do. This lack in transparency might discourage donors from becoming involved in charitable giving and reduce the trust in charity organizations.

The second activity, **fundraising**, can be defined as the process of giving time and effort to a specific need. Potential participants may need to gather information on event details, register for an event, pay a participation fee and collect sponsorships from other people. Moreover, the nature of the event and the degree of involvement influence the fundraiser’s activity. Fundraisers may just turn up to support others mentally (e.g., cheering at a marathon), buy an event ticket or items at the event (e.g., registering for a party or buying a cake), donate at an event (e.g., donating at a gala dinner) or actively take part in the event (e.g., running a marathon).

Internet research for fundraising events showed that charities do list their own events on their websites. However, there are only a few websites which list collectively the events of various charities in a specific area. Hence, a higher level of participation might be achieved with a clear overview of such events.

Finally, people can donate their resources or money to **charity shops** by bringing their own goods or purchasing second-hand items. The traded items can be textiles (e.g., clothes, shoes), furniture (e.g., mirrors, photo frames), equipment (e.g., sport equipment, books, CDs) or accessories (e.g., bags, jewelry).

The project’s research revealed that the number of charity shops is growing, especially in Western countries. This might be due to the throwaway culture which has emerged over the last few decades, but also to the current recession, which makes people feel less able to give money yet perhaps still able to donate unused items. Moreover, a social trend was observed, whereby people would like to do something “good” while buying something. Campaigns such as Fair Trade might confirm this trend.

Charity Value Chain

In contrast to services in commercial sectors, the charity sector is strongly driven by the beliefs of people who want to support a specific cause [15, 23]. It is crucial that charities understand why people give to causes and communicate their services accordingly to achieve a long-term commitment [9]. Based on LocAid’s market research and interviews, the most prevalent challenges for charities are the lack of information made available, and their trust and transparency, both of which are instrumental in deterring people from giving more to charities. In addition, some charity services, especially through the Internet, are inconvenient to use. Hence, this paper will draw attention to the information, linked to general charity awareness, trust,

transparency and convenience, and how these issues could be mitigated through any kind of value added within the value chain.

According to Saxton [23], people can be motivated to give charitably on different levels, from a shared identity (“I share their vision”) to the effects on their local environment (“It makes a difference to me”). Other scholars identify, therefore, the distinct importance of brand management for charities in order to communicate and symbolize the specific beliefs of charitable people, motivate them and facilitate the process [10, 11]. Hakinson [10] divides a brand into functional attributes (the cause) and symbolic values (brand values) like humanity, impartiality, neutrality or independence. Her research shows that charity managers use brands to fulfill a range of organizational objectives such as raising awareness, building trust, fundraising, educating or lobbying. The small amount of existing research on charity organizations and their processes shows that, in order to create value, a distinct focus on the cause and its symbolic values is required.

The framework in Fig. 4 is an attempt to identify potential aspects of a charity value chain as a service. It is based upon the service framework of Gabriel [8] with some adjustments taken from market research and interviews with respect to the LocAid project.

Primary attributes

Service design:

The design of a charity service will be oriented towards beneficent people and their specific motivations for a cause. Marketing might play an important role in incorporating the cause, the charity value and the resource provision into the service design or even in building a specific charity brand. Customer segments, and specifically their intrinsic motivations, might be identified through market research to enable an effective service design.

Knowledge management:

The knowledge management phase could be a potential step in enabling effective information provision about donors and their profiles. Customer data would need to be stored intelligently in order to match the specific needs of customers with identified relevant causes and projects. The organization would also need to ensure that beneficent people are aware and sufficiently informed about the charity and its service value.

Communication and feedback processes through customer service might strongly support the effectiveness of the knowledge management phase.

Delivery systems management:

The delivery phase of a charity service would aim to ensure that the most prevalent challenges of trust, transparency and convenience are addressed. Specific focus might be given to the convenience of the search, selection, payment and registration processes for a cause. This might be equally important for all service channels, whether on the web, via a mobile, via a call-center or by personal interaction. Trust and transparency might be enhanced within this step through, e.g., successful fundraising events, a strong focus on payment security, trust seals or an immediate donation confirmation.

Service competition management:

Strong competition for donations has been observed during LocAid’s market research. The service competition management phase would be a potential value chain step to signal the positive difference of the charity in comparison to its rivals in the market. As charities try to incentivize customers to donate on a regular basis, long-term satisfaction will be crucial for charities. A focus on trust, individual needs and the visible effects of donations might be supportive in building strong customer relationships. Communication after donations might be targeted, e.g., through regular updates on a cause.

Supporting attributes

People:

The project’s research also revealed that the value of charity services was extremely dependent on value co-creation with customers since, without the support of charitable people through help, money or resources, a charity itself would be meaningless. Hence, donors should feel their own importance throughout the whole value chain. People might also refer to the employees of the charity, who should represent and believe in the underlying causes. They should signal seriousness, generosity, sensitivity and customer-friendliness and try to build trust in order to match the offered service with the donor’s expectations.

Process information:

Throughout the value chain, the charity process would need to be as transparent as possible. Charitable people should be able to know the destination of their contribution and its effects on a specific cause. It is proposed that employees should be able to access this information and provide it, if appropriate, to customers. Optimized information technology might help in this step to ensure data quality, tracking and provision.

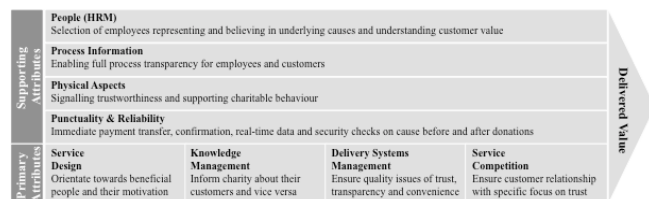


Figure 4. The charity value chain, Source: own illustration

Physical aspects:

The physical aspects of charities would signal the service value with an emphasis on trustworthiness and the charitable behavior of giving people. These aspects might be divided into “Marketing” - online (e.g., website, application) or offline (e.g., catalogue, flyer) - and “Facilities” (e.g., office, furnishings, charity shop).

Punctuality and reliability:

Reliability, and punctuality which is closely related, would be crucial for charities to build trust. Customers would need to be assured that the charity service is serious and reliable, for instance in providing the donated money to the corresponding cause efficiently. Immediate payment transfer and confirmations, real-time data, regular data check-ups and security check-ups on causes before and after donations might be able to support this value chain step.

B. The Local Aid Project

The mobile application LocAid (i.e., “Local Aid”) was developed in the context of a university project at the London School of Economics and Political Science. It was designed according to the findings of market research, interviews with charities and charitable people and the value chain identified above. In the following, the application itself and a brief overview of the project are presented.

The application LocAid is a mobile application that allows users to find, support and connect to local charity organizations. The application offers the three main functionalities of donating to local charity projects, registering for local fundraising events and finding local charity shops. The innovations put forth through LocAid are driven primarily by the three distinct characteristics of high transparency, local applicability and mobility. The idea is based on the concept of offering value added for users and charities through enhanced information provision and local charity awareness to increase local charitable giving.

The project of the application development was organized into two interrelated, parallel work streams, one focusing on the foundation, justification and evaluation, and the other on the development of the application.

In the first stream, a market analysis, surveys and interviews with charitable people and charity organizations were performed to obtain an understanding of the charity market and its processes and needs and to identify the concrete definition of the application and its required functionalities and design. The surveys were also used to justify different aspects of the initial requirements. The participants were selected as a potential user audience, in order to evaluate the importance of different features of the application from their perspective. The survey feedback was found to be relatively positive, with 96 percent of people considering the application to be useful and more than 60 percent strongly agreeing that it would encourage them to engage more in charitable activities. Users also indicated great interest in additional functionalities such as a map, calendar and news features. The most prevalent issue for

participants (more than 70 percent) was the security of the payment method, which was viewed as critical in building trust before using the application. Two focus groups were employed to evaluate the innovation, its usefulness, and potential, additional functional requirements. To evaluate LocAid from a business perspective, a business model was created with a specific focus on user development, the revenue model and the cost structure.

The second stream, the development process, consisted of four main steps. It was based on the waterfall development model [22], allowing iterations between all process steps and using unified modeling language (UML) to complement the design process. The implementation was carried out in two steps: firstly, a functioning GUI prototype was created and feedback was received through the focus groups for further improvements; secondly, the development of a rudimentary real prototype was started in XCode. Issues during implementation were related mostly to the availability of data on charity projects. Most of the available data were only for the charity itself as a whole, but not for specific projects, as the application requires. Future steps, therefore, would include considering direct cooperation with a larger charity with strong local involvement and highly accessible project data. This paper focuses mainly on the computer–human interaction, rather than the implementation issues.

C. Value Added Mobile Application

As described in Section III A, the literature has identified brand and belief creation as two ways to support charities and their value creation. Mobile technology might be another recent way to add value to the charity value chain. Through its distinct characteristics, localization, personalization and connectivity, it might be able to tackle the most prevalent problems of charities which deter people from engaging more with them, in particular the lack of awareness and information, trust, transparency and convenience. The mobile application LocAid was designed to address these problems and is an example of an innovative mobile technology with great potential to add value to the value chain of charity services.

Awareness and Information:

During the “service design” and “knowledge management” phases, sufficient awareness and information were regarded as being fundamental to market charities’ projects, events and general work. Commonly, charities send street volunteers to inform people, start campaigns to increase awareness of specific projects and have a website presence to keep users up-to-date about events and their work. However, these activities reveal difficulties in explicitly targeting the charitable people and in addressing their individual information needs.

Mobile technologies might be able to address these difficulties through their localization, personalization and

connectivity characteristics. In the case of LocAid, functionalities were incorporated to locate charitable individuals and to show specific donation projects, fundraising events and charity shops “around” them, thus customizing the application to individual needs. Moreover, the application was designed in such a way that personal accounts were offered in order to tailor the content to the specific user (e.g., users get an overview of their past donations or events and receive updates on ongoing projects). Finally, LocAid was provided with a feature to give users information when and where needed, making charitable giving a real-time activity and keeping the individual user informed at any time about the current status of their beneficial actions.

Trust:

Trust was identified as a critical concern throughout the whole charity value chain and generally as a complex, prevalent factor in every financial transaction. Charities should build relationships with a charitable society and increase their involvement to gain and sustain the public’s trust. Traditional advertising channels, such as physically approaching people, attempt to develop trust and customer relationships through personal contact. However, many people feel pressured and hence refuse to become involved in this direct approach.

Mobile technologies might create a two-way connection between the charity organizations and the users without pressurizing them. Moreover, customer relationships might be built through personalization. LocAid, for example, includes features to display updates of projects to which users have donated and the most popular projects of other users. In addition, the local focus of the application was chosen to address the trust issue, as local charities might often be better known and their projects can be visited in person. Finally, during the development of LocAid, a networking functionality was considered, connecting charitable people through the application, creating a community and thus eventually developing a lock-in effect.

Transparency:

Transparency was found strongly to influence trust and was seen as crucial for supporting activities in the value chain, such as “process information” and “systems delivery management”. The surveys and interviews showed that not only the process of money transactions, but also the money’s destination and effect should be transparent. Charitable people were critical of the fact that they do not know where their money goes and their perception of charities’ transparency was very often low. Almost all reported that their most important concern was to see the actual result of their charitable actions, leaving them with the desired satisfactory feeling of having done something good.

Mobile technologies might increase transparency through local applicability and customized content. LocAid was designed to give attention to local projects and events in order to increase the perceived visibility of donated money and its effect on local causes. Accordingly, beneficent people can help causes where they see the actual results, in contrast to foreign aid support, where users often feel wary about the destination and use of their money. In addition, personalized features, such as receiving feedback and updates on projects to which a user has donated money, were chosen to foster customer relations management and, thereby, to increase transparency.

Convenience:

Convenience is a factor which has received more attention in recent years due to the time constraints in today’s society. As market research and surveys show, it has developed into a core focus in the charity value chain process, especially during the “service delivery” phase. Users engage with a service if it is simple, convenient and efficient. Conventional efforts to offer convenience to charitable people, such as actively approaching people on the street rather than asking them to go onto websites and visit charity offices, or sending forms for event registration via email, cannot meet individual needs to engage in charitable activities at the right time and in the right place.

In contrast, mobile technology can offer service “around the clock”, giving the advantage of serving customers whenever and wherever it is convenient for them.

Furthermore, as previously indicated, LocAid’s functionality design was focused on personalization and localization (e.g., giving reminders of upcoming events for which users have registered or simple directions to charity shops near the user), linking charitable giving with a comfortable service provision. Related to this, simplicity in design was seen as fundamental to providing convenience, leading to strict guidelines during the development (e.g., the steps required to carry out a donation or fundraising registration should not exceed 3-4 clicks).

The above customer-focused discussion demonstrates the potential ability of LocAid to add value to the existing value chain of charities. Aside from acquiring, serving and satisfying charitable people in a more efficient and effective way, the application may also support charities in their information management and operational efficiency. For example, donations and fundraising registrations can be tracked in real time, new information can be communicated instantaneously and marketing can be conducted through a more targeted approach – all offering the potential for competitive advantages in services and processes. Accordingly, LocAid might not only help charities to deliver a better service, but simultaneously offer benefits to charities, the benevolent society and the people in need, hence acting as an intermediary co-creating value between the three interrelated parties.

Overall, the case of the development of LocAid demonstrates how the effective design of mobile technologies might be able to address prevalent problems and add value in established value chains. The characteristics of localization, customization and mobility were systematically applied to the design of the application in order to fulfill its value added need.

IV. DISCUSSION

The LocAid case shows how the characteristics of mobile technology can add value within an established industry, more specifically within the charity value chain. However, some limitations of the framework and the mobile technology effects need to be considered. Firstly, the relationship of the charity value framework with the literature will be discussed and, secondly, the issues of the mobile technology effects will be described.

The framework is strongly related to Gabriel's [8] proposed service chain framework but, unlike in the original model, the activities of "moment of truth" and "delivery system management" are combined. For charities, these two activities cannot be differentiated as the actual "service moment" of a charity often cannot be defined due to its subjective nature. People will define their service moment differently: for some, the payment to a cause will be the main service moment, while for others it will be the actual resource provision or positive effect in the future. The main relation to Porter's original model is the differentiation between primary and supporting activities and the fundamental idea of how value is created within a "chain". The charity value chain is, in contrast to Porter's original model, a service value chain, which emphasizes not the creation of a product but the co-creation of value with its customer.

The charity value described in this paper is formed mainly from market research work (interviews). The academic literature was not found to be sufficiently detailed and was too generic in some cases to be logically conclusive. This is a shortcoming of this work, as the model might require further testing. In addition, the model framework proposed for the charity value chain is only validated for the case of London, or at most the UK; hence, attempts to extend the results to other contexts would require a reassessment of the assumptions for calibration.

The positive effects of the mobile technology on the charity value chain have certain problematic characteristics, which will be critically discussed for each attribute. An issue for all attributes is that the value added can usually only be leveraged if the charity fulfills certain prerequisites (e.g., transparency can hardly be enhanced if the charity does not provide sufficient data on its processes). This issue is strongly related to the key implementation issue regarding available data.

Considering the **supporting attributes** of the value chain framework, *people* and *physical* attributes are unlikely to be influenced by mobile technology. *Process*

transparency and increasing trust through *punctuality and reliability* attributes can be improved, but only if the mentioned complementary attributes are present (e.g., the charity needs to be reliable before a mobile technology can add value). Regarding **primary attributes**, mobile applications add value to the *service design* and specifically to general charity awareness. Charities need to be aware that, in the case of LocAid, these positive effects can occur similarly for all cooperating partners of the mobile application service provider. Consequently, the service could be used more out of a necessity to compete rather than as an idea to gain any value added. The *knowledge management, delivery systems management* and *service competition* can be affected very positively through the distinct characteristics of personalization, localization and connectivity of a mobile application. Similarly to the supporting attributes, significant value added can only be fostered if the required conditions are fulfilled.

Further limitations of value added through mobile technology arise from the effects on trust and transparency, in combination with taking payments through a mobile application. Trust is a complex concept and a prevalent and important factor for every financial transaction. The ability to measure trust is limited by the fact that it is a multidimensional socio-technical factor which may be differently interpreted by every individual and which has received numerous different definitions [5, 7, 19]. Most scholars agree that trust is a belief in "favorable expectations" [5] based on previous interactions. The problem is that a mobile intermediary increases the number of parties which need to be trusted, in this case not only the charity itself but also the mobile service, leading very often to an as yet unaddressed problem of perceived security. Trust and security, if not perceived by a user, have been identified as major inhibiting factors in user acceptance of payments through a mobile application [5, 16]. Security can generally be divided into objective and subjective security. Objective security denotes the concrete technical details which are unlikely to be perceived by the consumer. Subjective security is the perception of a user that the mobile payment procedure is secure and can be seen to combat the perceived risk [5, 6, 21, 24]. Consumers often perceive payment solutions as insecure, thus do not trust them and are therefore unwilling to use them.

The positive effects of mobile technology could be further mitigated by personal characteristics of charitable people, such as their age, beliefs or values. Mobile technology and especially payments through mobile applications are used mostly by younger generations. Because the most charitable group of people is aged between 45 and 64 years [26], their adoption, or even knowledge, of mobile technology can often be limited. Furthermore, the local aspect of LocAid, based mainly upon the localization feature, could go against the beliefs of many charitable people, who generally come from developed countries and often see no reason to donate or support local

charities but want to help foreign poorer developing countries. Ultimately, the idea of an extra service fee due to an additional intermediary could put many people off because, firstly, the donated money could be reduced and, secondly, some believe a charitable intermediary should not aim to gain any benefit at all. This concern should be taken into account in any business-model development for a mobile value service within a charity value chain, for instance by not charging donors at all and charging charities only to the extent that the value added exceeds the additional service charge.

Finally, the effects of the LocAid case need to be critically debated from the perspective of the overall charity industry. Firstly, even though the localization feature can indeed add great value if a charity supports local projects, charities with non-local projects or no possibility to provide local individual information have only limited or no use for the mobile value service. The distinct localization feature, therefore, only applies to charities with local projects. Secondly, the application itself is limited within the charity industry because it does not consider volunteering services, which are of great importance to many charities. The volunteering process often involves a higher level of commitment, and specific skills and training and differentiates itself from donations, fundraising and shop functionalities for any application development.

The LocAid case shows how design specifications can be derived by analyzing the specific value added of the application in relation to the industry into which it is introduced. Alongside innovation, the application was designed in order to signal quality and generosity to overcome trust constraints, but also to incentivize users (e.g., the color green was chosen as the main color due to its signaling of generosity, support and money). Developers and graphic designers should work hand in hand to produce a coherent design which suits the specific requirements of an industry.

The discussion shows that the proposed charity value chain and the effects of the mobile technology and its value service can generally lead to value added, but both the framework and the value added are limited due to the framework's uncertainty, the intermediary character of the mobile technology and the general trust issue within the charity industry.

V. CONCLUSION AND FUTURE WORK

The approach to understanding the role that mobile applications such as LocAid can have in value chains is an area which has not been researched in depth and companies have been slow to understand and plan for future implementations. The waterfall model for the design of mobile applications, when used with sufficient care and vision, is still adequate for providing solutions when required.

The proposed charity value chain framework shows how value is co-created with the customer and which specific

attributes can add value to this service. The specific issues of trust, transparency and convenience in the charity sector offer a basis for analyzing the positive effects of mobile technology. The distinct mobile technology features of localization, connectivity and personalization can be related to each value chain attribute and offer strong value added overall.

In terms of design, the carefully crafted attention to detail, in terms of application design, services, trust, etc., allows the provision of an integral solution for the delivery of this type of service, which has been positively embraced by practitioners in interviews with charities in London, and there is interest in releasing the application and its future enhancements in the real life market.

This research paper contributes to the field by presenting a new, business-oriented direction for research in computer science. By focusing on human-computer interactions in relation to specific value chains, it encourages academics and practitioners to work together in order to achieve mutual benefits. In addition, the very practical findings of this paper can help established services to understand the value which new technologies, in particular mobile technology, can give to their businesses and to create an interest in innovations and new developments in the future.

Future research should further assess the proposed value chain framework but also try to identify more specific features of mobile technology which can create value added, and show how practitioners in related industries and developers can use these opportunities to devise practical guidelines such as design specifications.

REFERENCES

- [1] T. Altenburg, "Donor approaches to supporting pro-poor value chains," Report prepared for the Donor Committee for Enterprise Development Working Group on Linkages and Value Chains, Bonn, Germany, July 2006.
- [2] P. Ballon, "Control and value in mobile communications: a political economy of the reconfiguration of business models in the European mobile industry," unpublished.
- [3] S. Barnes, "The Mobile Commerce Value Chain: Analysis and Future Developments," *International Journal of Information Management*, vol. 22(2), 2002, pp. 91–108, doi:10.1016/S0268-4012(01)00047-0.
- [4] C. Coursaris, K. Hassanein and M. Head, "Mobile Technology and the Value Chain: Participants, Activities and Value Creation," *International Journal of Business Science and Applied Management*, vol. 3(3), 2008, pp. 14–30.
- [5] U. Cyril, G. Gan, J. Ademu and S. Tealla, "Modelling User Trust and Mobile Payment Adoption: A Conceptual Framework," *Communications of the IBIMA*, vol. 3(29), 2008, pp. 224–231.
- [6] T. Dahlberg, N. Mallat, J. Ondrus and A. Zmijewska, "Past, Present and Future of Mobile Payments Research: A Literature Review," *Electronic Commerce Research and Applications*, vol. 7(2), 2007, pp. 65–181, doi:10.1016/j.elerap.2007.02.001.
- [7] T. Dahlberg, N. Mallat and A. Öörni, "Trust Enhanced Technology Acceptance Model – Consumer Acceptance of Mobile Payment Solutions," *Proc. 2nd Mobility Roundtable*, Stockholm, Sweden, May 2003.

- [8] E. Gabriel, "Value Chain for Services: A New Dimension of 'Porter's Value Chain'," *IMS International Journal*, vol. 34, 2006.
- [9] B. S. Guy and W. E. Patton, "The Marketing of Altruistic Causes: Understanding Why People Help," *The Journal of Consumer Marketing*, vol. 6(1), 1989, pp. 19–30, doi:10.1108/EUM0000000002536.
- [10] P. Hankinson, "Brand Orientation in Charity Organizations: Qualitative Research into Key Charity Sectors," *International Journal of Nonprofit and Voluntary Sector Marketing*, vol. 5(3), 2000, pp. 207–219, doi:10.1002/nvsm.114.
- [11] S. Hibbert and S. Horne, "Giving to Charity: Questioning the Donor Decision Process," *Journal of Consumer Marketing*, vol. 13, 1996, pp. 4–13, doi: 10.1108/07363769610115366.
- [12] R. Kaplinsky and M. Morris, *A Handbook for Value Chain Research*. Report prepared for IDRC, University of Sussex Institute of Development Studies, 2001.
- [13] M. Kleijnen, K. De Ruyter, M. Wetzels, "An Assessment of Value Creation in Mobile Service Delivery and the Moderating Role of Time Consciousness," *Journal of Retailing*, vol. 83(1), 2007, pp. 33–46, doi: 10.1016/j.jretai.2006.10.004.
- [14] Y. Kuo, C. Wu and W. Deng, "The Relationships among Service Quality, Perceived Value, Customer Satisfaction, and Post-Purchase Intention in Mobile Value-Added Services," *Computers in Human Behavior*, vol. 25(4), 2009, pp. 887–896, doi: 10.1016/j.chb.2009.03.003.
- [15] S. Lee, "Marketing charities in the 1990s," in *The Henderson Top 1000 Charities: A Guide to UK Charities*, R. Henderson, Eds. London, UK: Hemmington Scott, 1993.
- [16] N. Mallat, "Exploring Consumer Adoption of Mobile Payments – A Qualitative Study," *Proc. Helsinki Mobility Roundtable*, Helsinki, Finland, June 2006.
- [17] B. Martin and P. Nightingale, "Introduction," in *The Political Economy of Science, Technology and Innovation*, B. Martin and P. Nightingale, Eds. Cheltenham, UK: Edward Elgar, 2000, pp. 13–42.
- [18] B. Nooteboom, "Service Value Chains and Effects of Scale," *Service Business*, vol. 1(2), 2007, pp. 119–139, doi: 10.1007/s11628-006-0009-4.
- [19] P. A. Pavlou, "Consumer Acceptance of Electronic Commerce. Integrating Trust and Risk with the Technology Acceptance Model," *International Journal of Electronic Commerce*, vol. 7(3), 2003, pp. 101–134.
- [20] M. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance*. New York, NY: Free Press, 1985.
- [21] K. Pousttchi and D. G. Wiedemann, *What Influences Consumers' Intention to Use Mobile Payments?* New York, NY: Free Press, 2007.
- [22] W. W. Royce, "Managing the Development of Large Software Systems: Concepts and Techniques," *Proc. 9th International Conference on Software Engineering (ICSE 87)*, IEEE Computer Society Press, 1987, pp. 328–338.
- [23] J. Saxton, "A Strong Charity Brand Comes from Strong Beliefs and Values," *Journal of Brand Management*, vol. 2(4), 1994, pp. 211–220.
- [24] P. G. Schierz, O. Schilke and B. W. Wirtz, "Understanding Consumer Acceptance of Mobile Payment Services: An Empirical Analysis," *Electronic Commerce Research and Applications*, vol. 9(3), 2010, pp. 209–216, doi:10.1016/j.elerap.2009.07.005.
- [25] C. Sørensen, *Enterprise Mobility: Tiny Technology with Global Impact on Work. Technology, Work and Globalization Series*, Hampshire, UK: Palgrave Macmillan, 2011.
- [26] UK Charity Commission, *Charities Act 2006*. [online] <<http://www.legislation.gov.uk/ukpga/2006/50/contents>> [accessed 29 February 2012].