VALUE CO-CREATION AND OPPORTUNITIES IN HEALTH CARE AND WELLBEING: THE CASE OF THE GREEN PRESCRIPTION

Research paper

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Abstract

The Green Prescription (GRx) is a health and wellbeing service that aims to manage the increasing obesity rates in the New Zealand population by providing free advice and support to at-risk patients. We evaluate the GRx service ecosystem using a qualitative approach and applying a value co-creation framework. The resulting mapping allows us to identify new value co-creation opportunities and implications for practitioners. The research contributes a mapping of customer, supplier and encounter processes to a healthcare ecosystem and identifies existing and new value co-creation opportunities within the GRx ecosystem. We suggest that the GRx provider design a technological solution that allows the actors within the ecosystem to collaborate and create value. We also suggest that the service supplier could facilitate value co-creation by considering patients' extrinsic motivators. The service supplier could improve the health-related intervention delivery by the use of Web 2.0 facilities, and enhance resource-sharing relationship experiences by making transparent a larger range of resources. Our study shows how the healthcare service provider may benefit from understanding active customer involvement in the relationship experience. We suggest that innovative research approaches such as the one applied may be useful when studying active customers and co-creation practices.

Keywords: value co-creation, green prescription, value co-creation framework, health, New Zealand.

1 Introduction

In the last few years, the obesity rates in New Zealand have been increasing. Currently, the country has the third highest obesity rate among the members of the Organisation for Economic Cooperation and Development (OECD) (OECD, 2017). As the 2013-2014 New Zealand Health Survey shows, 31% of the adults surveyed in 2013-2014 were obese; this represents an increase of 4% compared to 2006-2007 (Ministry of Health, 2014). The survey data indicate as well an increase of the child obesity rate: from 8% in 2006-2007 to 11% in 2013-2014.

The New Zealand Ministry of Health runs a number of programmes that address different aspects of the problem (Ministry of Health, 2016a). One of them, the Green Prescription (GRx) has been offered since 1998 (Ministry of Health, 2016b). GRx is a written advice provided to a patient by a health professional, such as a General Practitioner (GP). The prescription aims to help the patient become more active and eat healthier. Once a GRx is issued, a GRx support person contacts the patient to discuss the support available (e.g., motivating and helping set goals, and advising about healthy eating and activity opportunities). During a limited period of time (usually between three to six months), the patient is encouraged

to have a healthier lifestyle by regular monthly telephone calls, face-to-face meetings, or group meetings in a community setting (Ministry of Health, 2016b). The progress of the patients is reported back to the referring health professional. Together, this network of actors and communications between them form the GRx ecosystem.

Research results have indicated that overweight or obese children are more likely to be overweight or obese as adults (Reilly et al., 2003). As part of the New Zealand Government's plan to prevent and manage obesity in children and young people under the age of 18, the GRx initiative has been extended to young people, children and their families, under the name of GRx Active Families (Ministry of Health, 2016a). The programme has been moderately successful (O'Neill et al., 2016). However, the obesity rate in New Zealand has continued to grow.

While there has been some discussion about implementing technological solutions to accompany the GRx programme, we are reminded about the assertion of socio-technical researchers who recognise that technologies change nothing in isolation and that in order to design purposeful systems we need to incorporate a wider perspective (Vickers, 1965; Alvesson and Spicer, 2012). We posit in our research that government initiatives in the area of healthcare and wellbeing services such as GRx will have a greater likelihood of success if they systematically incorporate the identified needs of the relevant stakeholders (e.g., children, young adults) into the design of the respective programmes. In line with value co-creation research on successful information technology implementation (Mikkonen et al., 2016; Peters et al., 2016), we posit that facilitating different stakeholder involvement in the design of systems may lead to a more successful uptake of these systems and to a stronger impact (Chandler and Lusch, 2015; Skålén et al., 2015).

It has been recognised in the literature that value co-creation occurs through the actions of multiple participants involved in specific roles and in a variety of complex customer-supplier interactions (Pera et al., 2016). We applied the process-based value co-creation model proposed by Payne et al. (2008) to identify and analyse the roles and interactions of customer stakeholders (e.g., young adults, families, children) and supplier stakeholders (e.g., Ministry of Health, GPs, nurses) in the context of the GRx ecosystem. The value co-creation process approach allowed us to identify new value co-creation opportunities that may be beneficial to the GRx ecosystem stakeholders. The resulting new value co-creation practices may become the vehicle for value realization and value co-creation within the GRx ecosystem. Our research was guided by the following research question:

What opportunities exist for stakeholders to be better involved in the value co-creation process of government based healthcare and wellbeing services?

The main contribution of the paper is the systematic identification of the value co-creation opportunities in a healthcare ecosystem. This addresses the identified need of paying sufficient attention to the role of stakeholders in the design of healthcare services that have an impact on them (Batalden et al., 2105; Bjørkquist et al., 2015; Barello et al., 2016). As a practical implication, we demonstrate how a value co-creation framework can be used as a comprehensive analytical tool to better understand the needs of the various stakeholders and their contribution as service value co-creators. The new value co-creation opportunities thus identified may help redefine the service value proposition and the redesign the service itself, in order to help stakeholders accomplish their goals.

The rest of the paper is organized as follows. Next, we present an overview of research into value and value co-creation, which is relevant to our case study. In the third section, we introduce the theoretical lens used in the analysis of the case study data. The fourth section describes the research methodology (interpretive case study research). In section five, we develop a mapping of the GRx ecosystem based on the selected value co-creation framework and add to it the external influences on the customer experience. The theoretical and practical implications including the identification of new value co-creation opportunities are discussed in section six. We conclude by presenting the contributions and limitations of our study and outlining future research directions.

2 Literature Review

Traditionally, perceived service value has been defined as the trade-off between service benefits, and customer sacrifices, both monetary and non-monetary (Al-Debei and Al-Lozi, 2014). For example, Choi et al. (2004) define perceived health service value as the worth that a health service has according to the customer's evaluation of the perceived benefits (e.g., good service quality) and sacrifices (e.g., the price paid for the service). From the perspective of service science and service-dominant logic (SDL), the service provider does not deliver service value; value occurs only when the service offering becomes useful to the service beneficiary (Spohrer et al., 2007; Vargo and Lusch, 2016).

2.1 Customer value and value co-creation

Service Dominant Logic defines service as the application of specialised resources for the benefit of another entity (Maglio and Spohrer, 2008). Service is an activity (or a series of activities) through which service suppliers and service customers interact in order to meet certain customer needs (Mele and Polese, 2011). Service value is co-created through the dynamic interactions of multiple actors (service customers, service providers, other stakeholders) who act as resource integrators within relatively self-contained and self-adjusting value creating service ecosystems (Anker et al., 2015, Lusch and Nambisan, 2015, Wilden et al., 2017).

According to the foundational principles of SDL, value emerges through service use ("value-in-use") and is determined solely by the customer who is always a value co-creator (Vargo and Lusch, 2016). As value-in-use is created during usage through customer experiences, customer participation in value co-creation is context specific (Helkkula et al., 2012; Lusch and Nambisan, 2015). Grönroos and Voima (2013) conceptualise value-in-use as "the extent to which a customer feels better-off (positive value) or worse-off (negative value)" based on the experience related to the use of the service over time. Their analysis of value creation shows that customers are not only co-creators/co-producers jointly with service providers but also act as independent value creators of "real" value. Real value emerges outside direct interactions with the service provider, with the real value creation process influenced by the customer's own ecosystem of customer-related actors.

Recognising the customer as a primary resource integrator who engages different types of service providers in the customer's own ecosystem, Heinonen and Strandvik (2015) have advanced the concept of customer-dominant logic (CDL). CDL provides a customer-centred perspective on value creation and co-creation that accommodates the role of the customer as value creator, in addition to the role of co-creator/co-producer (Anker et al., 2015). Recent empirical work (e.g., Tynan et al., 2014) has highlighted the need to acknowledge service experience as a complex and dynamic value creation process that is related to the service offering but not entirely determined by it.

2.2 Customer value in the context of health and wellbeing services

Defining co-creation as the process where actors share their resources during collaborative activities and interactions (co-creation practices), Frow et al. (2016) identify some of the important value co-creation practices that shape a dynamic and constantly changing health ecosystem. As health service users or consumers, customers create value through their necessary participation, for example as recipients of a medical treatment (Yi and Gong, 2013). However, Joiner and Lusch (2016) suggest that the health and wellbeing service value proposition needs to be expanded beyond the consumption of the service, to include shared decision making and taking into account customers' personal sense of value. For example, in the study of the NikePlus wellbeing ecosystem, value co-creation is seen as an experience co-creation process that allows the firm to learn how customers relate to the firm's offerings, and how these offerings may be made valuable to customers. The experience co-creation process involves rapid and continuous interactions between the firm and its customers in order to provide customers with opportunities to engage in significant and persuasive experiences (Ramaswamy, 2008).

Grönroos and Voima (2013) point out that customer value can be analysed across different dimensions. In particular, the functional, emotional and cognitive dimensions of customer value have been investigated empirically in the domain of health and wellbeing services (e.g., Choi et al., 2004; Zainuddin et al., 2013). Functional value is driven by extrinsic motivation, i.e., the customer consumes a health service for their own benefit, such as improving their lifestyle. The creation of emotional value is intrinsically motivated, i.e., the customer engages in a service activity because it is inherently enjoyable (Hagger and Chatzisarantis, 2008; Zainuddin et al., 2013). Perceived cognitive value influences customer satisfaction and behavioural intentions towards choosing a healthcare provider (Choi et al., 2004).

Customer participation and engagement is being increasingly recognised as an important factor in achieving the objectives of preventative healthcare and wellbeing strategies (Zainuddin et al., 2013). Individuals, families and communities are encouraged to become actively engaged in improving their personal health and wellbeing. Drawing on Grönroos and Voima's definition of value, this study identifies and explores further the value co-creation opportunities in the GRx ecosystem through the analytical lens of Payne et al.'s (2008) framework which considers perceived value as a cognitive, emotional and behavioural construct resulting from the customer and provider relationship experiences.

3 Analytical Lens: A Value Co-creation Framework

Payne et al.'s (2008) process-based conceptual value co-creation framework recognizes the importance of value co-creation processes (tasks and activities) through which service providers engage with customers, and acknowledges the need for a long-term, dynamic and interactive engagement and participatory practices involving both customers and service providers. As shown in Figure 1, the framework consists of three main constructs: 1) customer value-creating processes; 2) supplier value-creating processes; and 3) encounter processes.

The customer value-creating process is viewed as a set of activities that a customer performs in order to accomplish a certain objective. Through the relationship experience with suppliers and services, customers learn how to optimize the use of their resources. Payne et al. (2008) identify three components of the relationship experience: cognition, emotion, and behaviour. While cognition occurs as a result of information processing, emotion represents customer's attitudes and preferences. Behaviour is the actions that lead to relationship experiences; the outcomes of customer learning are manifested by emotional changes (i.e., changes of customer attitudes and preferences).

The supplier value-creating process is underpinned by the understanding of how customers create value. It represents a series of activities related to relation experience design. The series involves: 1) identifying co-creation opportunities; 2) planning, testing and prototyping value co-creation opportunities with customers; 3) provisioning services, managing customer encounters, and developing metrics to assess the strength of the value proposition. Learning more about customer requirements helps the supplier organization design its service offerings to gain competitive advantage (Romero and Molina, 2011).

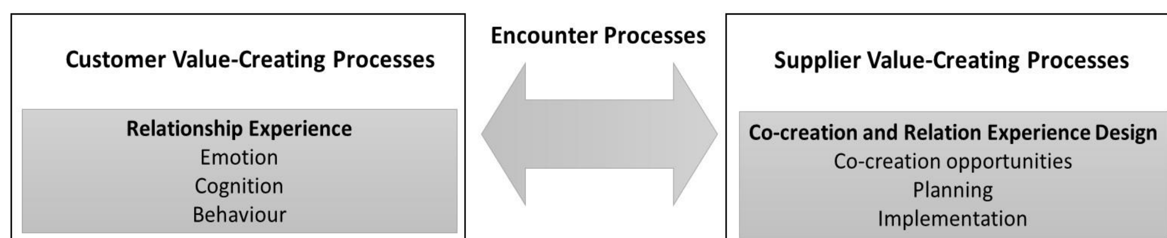

Figure 1. Conceptual value co-creation framework. Adapted from Payne et al. (2008).

An encounter process is a series of two-way interactions and transactions occurring between the customer and the supplier (i.e., encounters link customer and supplier value-creating processes). Three types of encounters facilitate value co-creation: communication encounters, usage encounters, and service encounters. While communication encounters are mostly initiated by service providers as a means to connect to customers, usage encounters comprise the routines and procedures followed by customers

when they actually engage with the service. Service encounters include the interactions between customers and service personnel; the latter provide help, support and advice related to the service.

Hardyman et al. (2015) point out that it is important to examine patient engagement within individual service encounters, and value co-creation within the micro-level of the immediate service experience, as a means of understanding better patients' roles, needs and requirements in their capacity of health service customers. As Payne et al.'s (2008) framework places the customer at the same level of importance as the supplier it is especially suitable for studying the GRx ecosystem from the perspective of its two main stakeholder types (i.e., patients and health service suppliers), and for identifying value co-creation opportunities.

4 Method

Case study research is particularly appropriate for examining fields without comprehensive empirical material (Benbasat et al., 1987) as is the case with value co-creation opportunities in the healthcare ecosystem. Moreover, interpretive research is suitable for our study as it helps us "…understand human thought and action in social and organisational contexts; it has the potential to produce deep insights into information systems phenomena" (Klein and Myers, 1999, p. 67). In this research, we delved into a single case study in order to study a complex situation in a specific context (Gibbert et al., 2008), and get deeper insights into the value co-creation opportunities as observed in a particular health ecosystem (Flyvbjerg, 2006).

As shown in Section 2, a value co-creation approach to the investigation of healthcare and wellbeing ecosystems has been successful in identifying their defining characteristics and studying their behaviour. More specifically, Payne et al.'s (2008) framework presented in Section 3 helped us apply a systematic approach towards the analysis of the GRx case study data, gain an understanding of how the ecosystem worked, and identify new value co-creation opportunities that may have a positive impact on the outcomes of the service.

We initiated our research by identifying the people, organisations, and technology that constituted the case study's ecosystem. In our particular case, Ministry of Health (the organisation) needs to address the current problematic situation in relation to the increasing obesity rates in the country by providing healthy eating advice and physical activities options to people who are obese or are at risk of becoming obese (the GRx patients), in order to help them improve their lifestyle. Ministry of Health acts as the service supplier, as they provide the GRx service to GRx patients (who act as service customers). The interactions among the patients and the GRx provider constitute the service encounters. The service encounters are facilitated by socio-technical means, e.g., phone calls, email, face-to-face meetings.

The GRx process for primary health care intervention is a well-defined programme as described in the flowchart presented in (Ministry of Health, 2016b). Further insights into the supplier and encounter processes were gained from Hamlin et al.'s study (2016) which evaluates the effectiveness of the GRx intervention.

To analyse the customer experience, we attempted to understand how customers get involved into and developed relationship experiences with the supplier and other actors in the ecosystem. We gathered data by collecting fourteen GRx success stories, available to the public from the web sites of the regional sport trusts' web sites (regional sports trusts are GRx ecosystem stakeholders, as they take part in the implementation of the programme). We selected the two most recent stories (i.e., the success stories published from 2016 onwards) from each of the following sport trust sites: Sport Auckland, Tautoko Services, Sport Whanganui, Sport Taranaki, Sport Northland, Sport Wellington, and Harbour Sport.

To ensure a balance, we considered as well the explanations provided by twelve respondents to the Green Prescription Patient Survey 2016 Report (O'Neill et al., 2016) who were not satisfied with the outcomes of the programme. For these respondents, the programme was not a success. Their replies show that at times, the GRx provider's actions can make a patient feel worse-off, and thus lead to destroying the GRx value.

O'Neill's (2016) report showed useful for our research also because it included quantitative data related to outcomes of patient relationship experiences (e.g., changes resulting from GRx), and data about encounter processes, such as how contact was first made with a GRx advisor. The report provided insights into processes that could not be gained from the programme's description (Ministry of Health, 2016b), for example, whom the patients exercised with.

All case study data were analysed qualitatively applying a directed content analysis approach (Hsieh and Shannon, 2005). In directed content analysis, data are initially interpreted and coded based on an existing theory. We inferred our theory-based coding categories from Payne et al.'s (2008) value co-creation framework, and used them to interpret and code the technical and interpersonal exchanges in the GRx ecosystem we found in the data.

The data were first searched for manifestations of customer and supplier value-creating processes, and encounter processes. Next, the data pertinent to customer value-creating processes were re-examined, and relationship experiences expressing emotion, cognition and behaviour were discerned. An example illustrating the initial data interpretation and coding is shown in Table 1. Cassandra's story is broken down into data segments that evidence the cognitive, emotional and behavioural aspects of the customer relationship experience (labelled C1, C2, and C3 respectively), data segments that illustrate supplier value-creating processes (labelled S), and data segments that represent encounter processes (labelled E).

Data from Cassandra's story
….Within the last year Cassandra has made some huge lifestyle changes (C3), with the support of Gaylyn who has been with her every step of the way. It was actually through her support person (Gaylyn) that Cassandra first heard about the GRx Programme. (S) "I wanted to join because I wanted to become more active. I also wanted to meet new people and make friends" (C2). "Before the programme the only exercise I was doing was delivering the property press around Shannon once a fortnight" (C3). Due to inactivity Cassandra mentioned that she was "lacking in energy, I was finding it hard to sleep at night. My stress levels were very high and I was always stressed". (C2) From attending the weekly GRx classes in Levin, (E) Cassandra has truly blossomed and she has given everything ago with a smile. (C2) "I am now more conscious of wanting to be more active (C1) and my support person Gaylyn has been helping me to set new challenges and getting me along to lots of events such as Whanau Tri, Ashhurst to Esplanade walk, Great Forrest event, Kawa Oranga Classic." (E)
Codes and labels
Relationship experience: Cognition (C1), Emotion (C2), Behaviour (C3). Supplier/provider's value-creating process: (S). Encounter process: (E).

Table 1. Interpreting and Coding Cassandra's Story (Tautoko Services Support, 2016).

For instance, Cassandra has been able to become more active as a result of her interactions with Gaylyn, which represents a behavioural dimension of Cassandra's relationship experience with her health advisor: "…within the last year Cassandra has made some huge lifestyle changes… Gaylyn has been helping [her] to set new challenges". The data segments "…attending the weekly classes in Levin" and also "[Gaylyn] getting me along to lots of events…" are two encounter process manifestations; they describe Cassandra's interactions with the GRx service process.

The coded data set was investigated further in order to identify the socio-technical contexts associated with each encounter process, and to determine what support the GRx service supplier provided to the customer processes identified. This allowed us to deduce opportunities for value co-creation that the supplier could embed in the GRx service design and implementation.

5 Findings

In this section we introduce the findings of the data analysis and identify opportunities for creating customer-centric GRx solutions. We begin by describing the supplier processes that occur in the GRx

context, including existing value co-creation opportunities. Next, we identify the customer value-creating processes and consider customer relationship experiences from a cognitive, emotional and behavioural perspective. The last subsection summarises the main encounter processes emerging from the case study data; the encounter processes show how GRx value is co-created at various touchpoints, or interfaces between the customer and the supplier.

5.1 Supplier processes

The GRx prescription programme was developed as a systematic process comprising a set of well-established activities. The procedures shown in Figure 2 represent the supplier processes used by the GRx provider to manage their relationships with GRx patients. For example, after having discussed a patient's activity level and willingness to change, the general practitioner or nurse may issue a GRx prescription (for the patient) to the GRx support team. A GRx health advisor will be responsible for contacting the patient and offering them support options. The patient will have the opportunity to join others in a weekly community programme in order to get regular encouragement and motivation. The progress of the patient is reported back to the referrer.

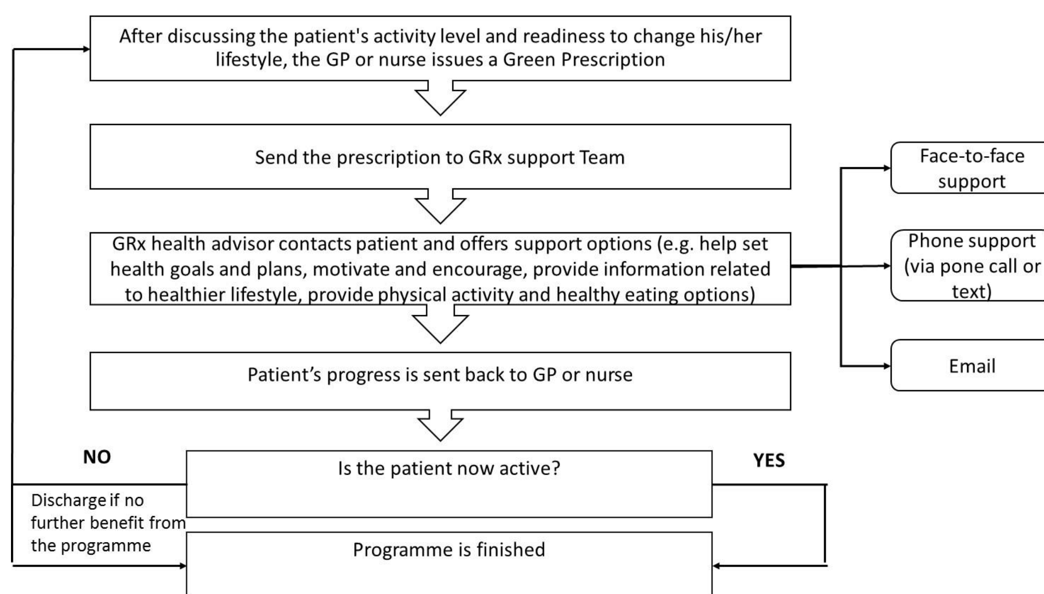

Figure 2. The GRx process. Adapted from (Ministry of Health, 2016b).

The GRx aims to promote physical activity for at-risk patients by providing advice and counselling intended to lead to behavioural changes. Foreseeing that potential patients may not get involved in any physical activities without external support, the GRx supplier facilitates value creation (i.e., patients reaching their goals) by connecting patients with health advisors, and by maintaining a GRx community programme. Thus, GRx is implemented as a set of regular interactions (encounters) between the patient and the health advisor, during a pre-determined period. The encounters' purpose is to enable the patient achieve their health objectives. Patients may also interact with other patients, by joining the GRx community programme.

Overall, the GRx provider makes little use of the technology to provide opportunities for value co-creation to its customers (i.e., GRx patients), and offers limited co-creation options. For example, the health advisor uses some socio-technical means (mostly phone calls and email messages) in order to provide ongoing interpersonal support and motivation, assisting patients in changing their physical activity behavioural patterns. The GRx community programme offers another opportunity for value co-creation, through regular face-to-face meetings.

5.2 Customer processes

In the context of our case study, the customer's value-creating processes represent sets of activities that the patient performs to achieve their health goals. These activities may depend significantly on what information, knowledge, skills and other resources patients have access to (Vargo et al., 2008). A number of specific customer processes emerged from the analysis of the case study data. Following also the systematic GRx process (Figure 2), we regarded each customer process as part of one of the three main GRx programme phases: initiation (when the customer decides to start the GRx programme), development (when the customer is actively participating in the programme), and closing (when the customer ends their involvement).

Table 2 shows the customer processes categorised according to the phases of the GRx programme. An initiation process example *(Making the decision to improve lifestyle*) is provided by Cassandra's story in Table 1, where she says: "I wanted to join because I wanted to become more active. I also wanted to meet new people and make friends".

Initiation	Development	Closing
Making the decision to overcome health problems Collecting information about healthy leaving Reading about the GRx programme Making the decision to improve lifestyle	Making new friends Following the health plan Encouraging others in similar situations to follow the GRx programme Setting small health targets and working away bit by bit Changing attitude for life Trying new physical activities Encouraging others for healthier lifestyle Participating in social events Exercising on a regular basis Trying new physical activities Participation in sporting events Reducing medication Interacting with others (e.g., family members and friends) for getting support or exercising together	Providing the success stories to help others out Giving feedback Maintaining changes made during the programme Organizing future support from health advisor or personal trainer Promoting GRx to others

Table 2. GRx customer processes.

5.3 Customer relationship experiences

Relationship experiences are mostly based on the information processing abilities of the customer and on the feelings and emotions they feel towards the GRx programme; how the customers behave depends on their experiences with having interacted with the supplier processes (Payne et al., 2008). Table 3 shows the customer relationship experiences emerging from the case study data, considered from an information-processing perspective (cognition) and from an experiential perspective (emotion and behaviour), and categorised according to the three main phases of the GRx programme introduced earlier (initiation, development and closing).

For instance, *Elaborating a plan of regular gym exercise* is the result of a customer relationship experience that is facilitated by the health provider at the initiation phase (cognition) while *Feeling extremely motivated to begin exercising* represents an emotional dimension of the relationship experience.

	Cognition	Emotion	Behaviour
Initiation	Elaborating a plan of regular gym exercise Knowing how to be involved in the community programme Understanding why and how behind healthy living	Feeling anxious about attending to the first GRx session Feeling nervous about the people and talking out Feeling that following the programme and learning new exercises is hard at first. Feeling extremely motivated to begin exercising	Starting exercising Starting the health plan
	No understanding how the community programme operates	Feeling not supported for following the community programme	Not following the health programme Returning visits to referrer since GRx
Development	Learning new skills (e.g., reading food labels) Learning about the right physical activity Learning how to improve lifestyle to get better health	Happy about new lifestyle and meeting weight loss goals Realizing that others are in similar situations Struggling with participation in the programme Enjoying a regular exercise programme Finding a physical activity quite rewarding Challenging himself/herself Feeling fitter	Being physically active Improving lifestyle by small changes in physical activities and diet
	Learning independently (i.e., all information found by the patient)	Don't want any support/follow up Feeling that activities prescribed are inappropriate Feeling extremely unsupported Annoying but someone talking by the phone about to be motivate and more active. Feeling embarrassed by the health advisor	Not being more active or even less active than before starting the programme
Closing		Feeling happy with new lifestyle Confident about maintaining changes made during the programme Encouraging others in similar situations to follow the GRx programme and to improve lifestyle	
		Feeling that the programme is a complete waste of time and effort Feeling disappointed with the experience	

Table 3. GRx customer relationship experiences (white cells: better-off experiences; shadow cells: worse-off experiences).

By adhering to the plan during the development phase, the patient experiences a behavioural change (*Improving lifestyle by small changes in physical activities and diet*). As part of the closing phase, the customer may be also able to influence others (*Encouraging others in similar situations to follow the GRx programme and improve lifestyle),* which is an illustration of the emotional dimension of the relationship experience. Another (positive) emotional aspect at the closing phase is captured by *Feeling*

*happy with new lifestyl*e. However, some customers may feel worse-off as a result of the health experience, as illustrated by “The activities prescribed to me were inappropriate for the level of health” (O’Neill et al., 2016.p. 83). Negative emotions at the closing phase indicate that the programme has had no effect on the level of physical activity of such GRx customers (*Feeling disappointed with the experience).*

5.4 Encounter processes

The customer’s total health experience with the GRx programme is the result of the content and quality of the different customer encounters (Choi et al., 2004), and on their execution (Payne et al., 2008). Therefore, value is accumulated over time (the health programme period) through experiences during usage (Grönroos and Helle, 2010). Our case study data indicated that value was co-created through direct interactions between the customer and GRx service provider (i.e., through service encounters).

For example, by participating in GRx activities on a weekly basis, the patient can learn how to improve his/her lifestyle and meet health and wellbeing goals (such as weight loss) while getting motivated by the health advisor, and by others in similar situations. Table 4 shows the main encounter processes identified and the channels used to support customer-supplier interactions.

Encounters/Channels	Technical means			Interpersonal exchanges
	Phone	SMS	Email	Face-to-Face
Initial contact with the health advisor	X			X
Getting support to follow the GRx activities	X	X	X	X
Participating in the GRx community programme				X
Elaborating on a health plan with the health advisor			X	X
Encouraging the patient to maintain the new lifestyle		X	X	X

Table 4. GRx service encounters.

It was already mentioned earlier that GRx used traditional socio-technical channels to support value co-creation (phone, SMS texting, face-to-face meetings, and email communication). As seen in Table 4, most encounter processes occur through multi-channel interactions. The most prevalent socio-technical channel is the face-to-face one; it provides support for interpersonal exchanges that can be part of each of the five encounter processes. However, the channels associated with the encounters identified above may not be always efficiently used. For example, according to (O’Neill et al., 2016, p.83), 38% of the patients who were dissatisfied with the GRx service, mentioned “insufficient follow-up/communication” as one of the reasons for their disappointment.

5.5 External influences on customer experiences

The case study data indicated that GRx customers obtained additional support from sources outside the GRx ecosystem, for example from personal trainers and from the staff at their local sports club (mentioned in three of the success stories). Furthermore, motivating others to have a healthier lifestyle was mentioned in two of the success stories. Similarly, 72% of the survey respondents in O’Neill et al.’s (2016) survey stated that they exercised with family members while 26% exercised with friends. A significant number of respondents (65%) said that because of their participation in the GRx programme, they encouraged others to be more active.

These findings support Sweeny et al.’s (2015) assertion that health care customers are likely to engage in interactions and obtain resources from sources beyond the health services supplier, such as peers, family and friends. Adding to Payne et al.’s (2008) framework to include interactions with the GRx service system environment, in Figure 3 we show the external influences on patient experience identified through the analysis of the case study data.

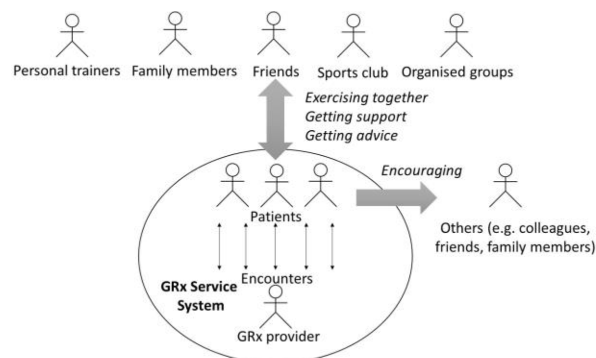

Figure 3. External influences on GRx patients.

6 Discussion

Grönroos and Voima (2013) point out that the service supplier may facilitate customer value creation by defining processes and delivering resources that help customers create value for themselves. According to Payne et al. (2009), the supplier processes should support the customer value co-creation, i.e., the supplier should identify the customer value co-creating processes and determine which of those it is feasible to support. However, our data analysis showed that customer value creation was not always well facilitated, and identified five customer processes that were only partially supported by the GRx service provider.

Two of the partially supported customer processes (*Encouraging others for healthier lifestyle* and *Exercising with family members/friends/others*) represent "linking" relationships: an ecosystem actor engages in a value-co-creating practice by connecting to actors beyond the ecosystem for advice or for access to scarce resources (Frow et al., 2016). In particular, the customer process *Encouraging others…* increases cooperation and trust in the health ecosystem. Frow et al. (2016) specifically emphasize practices that shape existing value propositions and inspire new ones. For example, Nike developed their NikePlus platform as a means to foster meaningful dialogue between runners who could then use the tool to motivate others to achieve their physical activities goals (Ramaswamy, 2008). Similarly, the GRx provider may design a technological solution, which may act as resource integrator for system's actors (e.g., exercise providers and patients) and allow them to collaborate, customise, and create value. It will be responsive to the customers' health needs and will allow the provider to meet a wider range of requirements such as facilitating linking relationships.

Another partially supported customer process was *Getting motivation from others (e.g., family members*). This process is about the impact of extrinsic motivation on GRx customers' behaviour. Hagger and Chatzisarantis (2008) define extrinsic motivation as engaging in a behaviour in order to achieve an outcome beyond the particular activity itself, for example, a person may keep a diet because they want to lose weight or become healthier. The authors state that extrinsic motivation is important for physical activities. Even if a physical or sports activity is inherently enjoyable to the person and thus may entail some intrinsic engagement, it may still require significant extrinsic motivation. We argue that a health plan that includes a health and physical activity program should aim to be extrinsically motivating to the target person.

The GRx programme outcomes are positive in the short-term (Hamlin et al., 2016, O'Neill et al., 2016); however the benefits of the GRx intervention in the long-term may need to be further investigated since some people are struggling with maintaining the desired level of physical activity as pointed out by (Hamlin et al., 2016). While at present GRx does not fully support the two customer processes *Maintaining changes made during the programme* and *Organizing future support from health advisor /personal trainer,* Web 2.0 offers an opportunity to improve the initiative. The use of Web 2.0 tools such as social media have increased rapidly, including searching for information about health and wellbeing practices and interventions (Korda and Itani, 2011). Thus, a technology based on the use of Web 2.0 tools may be utilised as a resource integrator for GRx system actors (e.g., physical exercise providers

and patients) in order to allows them to collaborate, to customise services, and to create value. The technological realisation may include number of options such as mobile applications, customer forum space and group support facilities. The essence of any socio-technical responses, such as those that incorporate Web 2.0 functionality, is that it will need to be flexible to accommodate changing customers' health needs.

Co-creation practices that increase interaction density including their number, duration, and connection patterns (Frow et al., 2016; Gilly and Torre, 2000), are essential to prevent the customer from feeling isolated and unsupported. The case study data indicate that in the GRx programme, this facilitation has not been completely achieved. For example, a respondent to O'Neill's survey states that they did not have any support from the health advisor: "Disappointed that after attempting to make contact myself and with help from my referral, I am still waiting" (O'Neill, 2016, p. 83).

Resource sharing relationships (Frow et al., 2016) can make transparent a huge range of resources (e.g., health information) to the actors. Resources within the GRx ecosystem are accessed through the GRx support team, so some patients may not get access to the information: "All the information I could [...] found myself" (O'Neill et al., 2016, p. 84). Utilizing the Web 2.0 platform to introduce new resource sharing relationships may help the provider increase interaction density and disseminate new health and wellbeing support ideas, and help the customer get more insights into how to reach their health goals; new value-in-use will be created through customer engagement in the new relationship experiences.

7 Conclusion

This paper details the study of one of the New Zealand government initiatives for reducing the continuously increasing obesity rates, applying a service value creation and co-creation approach. The case study provides insights into what value-creating processes occur and how the health service provider supports customer value creation. We used a value co-creation framework (Payne et al., 2008) to analyse customer value creation and identify value co-creation opportunities, for each of the three phases of customer/supplier interaction in the GRx ecosystem.

The study shows how the healthcare service supplier may benefit from a better understanding of the cognitive, emotional and behavioural dimensions of perceived customer value. It is unlikely that such understanding can be obtained via conventional customer surveys. Instead, we posit that innovative, micro-level research approaches to the study of customers and their practices may produce useful and informing insights into patients' behavioural motivators and perceptions about the value of the health service. The study adds to the relatively limited body of research evidence about patient engagement in health care (Hardyman et al., 2015). By demonstrating how GRx customer input can be used to improve the service the study addresses in part one of research questions in the research agenda put forward by McColl-Kennedy et al. (2017, p.19), namely "In what ways can healthcare customers contribute to the design of new service and products?" (RQ8).

The first contribution of our research is the identification of the customer, supplier and encounter processes. In particular, we pay more attention to customer's processes by considering the cognitive, emotional and behavioural dimensions of relationship experiences. Through relationship experiences, the customer can create value-in-use, which is accumulating over the time. The result of our analysis further confirms that as a result of service use experience over time, a customer may create either positive or negative value-in-use (i.e., feel better-, or worse-off) (Grönroos and Voima, 2013).

The second contribution is the identification of existing value co-creation opportunities and suggesting new value creation and co-creation practices. In the health ecosystem, an actor has the ability to both co-create and consume value created by the other actors in the network. The resulting resource integration process consists of practices which aim to produce outcomes that provide mutual benefits and contribute to the wellbeing of the ecosystem (Payne et al., 2009). These practices represent collaborative activities and interactions that actors engage in in order to address identified resource gaps. We have identified practices that may become the vehicle for value co-creation and the realization of co-created value in the GRx ecosystem.

Our third contribution is the suggestion that the GRx provider can find co-creation opportunities provided by changes in customers' preferences and lifestyles. Changes in the New Zealand customers' lifestyles are needed given the increasing obesity rates. The Ministry of Health should find new opportunities based on customers' preferences for healthier life (e.g., doing physical activities alone versus doing physical activities with family members). In addition, increased patent familiarity with the use of Web 2.0 facilities may be exploited by using Web 2.0 tools which may improve the delivery of the GRx initiative.

The analysis of GRx success stories proved to be a useful way of mapping customer, supplier and encounter processes to identify co-creation opportunities. However, we have analysed a relatively small data set. An analysis of other stories may help identify further opportunities for creating customer value-in-use that can be supported by the GRx service provider.

Information and communication technologies can enable more comprehensive, interactive, and responsive interventions to promote healthy lifestyles while offering practical and cost-effective delivery with enormous reach (Direito et al., 2016). It can also enable service system actors exchange resources, service encounters and thereby co-create value (Zhang et al., 2015). Further research may include applying a value co-creation approach to the development and evaluation of an innovative socio-technical solution that engages people in adopting a healthier lifestyle.

Finally, our focus has primarily been on the GRx programme. However, the New Zealand government has launched a plan to prevent and manage child obesity, which includes 22 health initiatives (Ministry of Health, 2016a). Future research may extend our study to include other government health initiatives, applying a service science approach (Spohrer et al., 2007) to the identification of value co-creation opportunities.

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