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Survey Paper

Established and Emerging Decision Constructs – A Taxonomic Perspective

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Abstract

One might assume information systems (IS) are developed so systems enhance the user experience and facilitate a satisfying, productive interaction. From prior research, the authors established this assumption was not safe and certain design features amongst some online retailers were atypical of 'good' design elsewhere. It was apparent the transactional process was being used to present consumers with optional extras (and other decisions) that not only slowed the process down, but also stressed and agitated users. The research identified some new and unusual decision constructs such as the 'must-opt'. The objective of the research presented herein is two-fold: to make an incremental contribution in first theorising and then identifying and categorising into a taxonomy some new decision constructs alongside established ones encountered throughout on-line Business-to-Consumer (B2C) transactional processes followed by a preliminary study confirming their existence and examining their clarity.
Keywords: IS development, user experience, website design, must-opt, decision constructs

1. Introduction

Many consumers are now experienced in purchasing goods and services online. It may be reasonable to assume they are quite familiar with the transactional process and able to navigate comfortably toward the final payments page. From prior research [1], [2], the authors established this assumption was unsafe and consumers exhibited significant levels of frustration and confusion. The transactional process was being used to present consumers with decisions that not only slowed the process down, but also stressed and agitated users through the use of atypical design features.

This paper is concerned with Business-to-Consumer (B2C) purchasing transactions. The non-transactional aspect is the browsing interaction that consumers engage in as they peruse and explore websites. Consumers may add items to a basket or shopping trolley but nothing is really psychologically committed until they complete their product selection and head for the checkout. Thereafter, they have passed the 'committal point' and begin the transactional process, the part of the interaction that interests the authors. This process between a business and a consumer is comprised of a number of decisions, typically across a number of pages, until payment is made and the process concluded. The critical importance of the user and their interaction with information systems is generally recognised and there is a universal supposition that a central objective of systems development is to maximise usability and deliver a satisfying user experience [3], [4], [5]. It is expected IS/IT practitioners employ good web design practices and consider the user in the development of interactions that are usable, useful and, often, enjoyable [5]. In practice, most businesses seek to offer a satisfying user experience, are honest brokers of their product and treat consumers fairly. Not all firms, however, are so benign, whether through neglect or intent. The transactional processes of some are peppered with elements that seem designed to force consumers to slow down, sometimes stop and perhaps accidentally select options they did not intend. To understand why consumers are experiencing these intermittent junctures, it was first necessary to categorise the types and the nature of decisions encountered in the transactional process.

The study is not concerned with decisions core to the actual product or service, such as quantity, shoe size or colour. It is the decisions that involve some element of optionality that are of more interest in this paper. Each decision point presents some form of a decision 'construct'. A construct is a graphical user interface (GUI) control or mechanism that allows a user to make a selection. Early controls were radio buttons, checkboxes, drop-down lists, spinners and sliders. New technologies have meant, for example, icons are presented as buttons or images, or interactive elements may be presented on-screen or in pop-ups or as widgets. The authors, by means of theorising and analysing websites, have proposed an exhaustive taxonomy of decision constructs, which is laid out in Section 4 and followed by a study presented in Section 5 confirming their existence and examining their clarity.

Another dimension of decision constructs is question framing. Questions may be framed in terms of acceptance (e.g., I would like to receive e-mail) or rejection (e.g., I would not like to receive e-mail). Alternatively, Lai and Hui [6] described these questions as 'choice' and 'rejection' frames, where positive phrasing corresponds with choice and negative phrasing corresponds with rejection of an option. This framing is discussed in detail in Section 2.2.

2. Regulations and Studies on Optional Charges and Pricing

2.1. Regulatory Attention

The Office of Fair Trading in the UK [7] carried out a study on the impact of pricing practices on consumer behaviour. In this study, they described a process referred to as 'drip pricing'. The tactic is the practice of presenting the user with an element of the price up front and then presenting additional components as 'drips' throughout the buying process. The 'drips' can be either compulsory, where they are inherent to the price of the product (e.g., shipping cost) or optional, where they are generally add-ons (e.g., an optional warranty). These drips can be presented in a variety of ways including as opt-ins and opt-outs. Their review of the available literature indicated consumers tend to retain the default option, even if it is detrimental to them, if one is presented. This decision may be due to inertia and an inherent belief the default is the vendor's recommendation [8]. Consumers may also choose the default to avoid the cognitive effort required to make a decision. Therefore, where the vendor uses an opt-out policy, the consumer may accept options that are detrimental to them or make purchases they do not need or want.

Following a case taken to the European Court of Justice [9], the European Union acted to bring some clarity to the definition of optional price supplements as specified in the regulations on the operations of air services [10]. A key article states "optional price supplements shall be communicated in a clear, transparent and unambiguous way at the start of any booking process and their acceptance by the customer shall be on an 'opt-in' basis." The judgment in relation to this regulation has clarified the issue somewhat. It states optional price supplements are not unavoidable and:

> In particular, the last sentence of Article 23(1) of Regulation No. 1008/2008 refers to 'optional price supplements', which are not unavoidable, in contrast to air fares or air rates and other items making up the final price of the flight, referred to in the second sentence of Article 23(1) of that regulation. Those optional price supplements therefore relate to services which, supplementing the air service itself, are neither compulsory nor necessary for the carriage of passengers or cargo, with the result that the customer chooses either to accept or refuse them. It is precisely because a customer is in a position to make that choice that such price supplements must be communicated in a clear, transparent and unambiguous way at the start of any booking process, and that their acceptance by the customer must be on an opt-in basis, as laid down in the last sentence of Article 23(1) of Regulation No. 1008/2008.
>
> That specific requirement in relation to optional price supplements, within the meaning of the last sentence of Article 23(1) of Regulation No. 1008/2008, is designed to prevent a customer of air services from being induced, during the process of booking a flight, to purchase services additional to the flight proper which are not unavoidable and necessary for the purposes of that flight, unless he chooses expressly to purchase those additional services and to pay the corresponding price supplement.

While the regulation only applies to airlines, the definition above relating to optional price supplements is clear and could be used to define optional price

supplements on other e-commerce sites. The European Union has recognised the need for regulation in relation to other forms of distance and off-premises contracts, which would include e-commerce transactions. They have introduced a new directive on consumer rights [11] to protect the consumer in distance contracts. This directive states additional payments above and beyond the minimum cost of the transaction require the explicit consent of the consumer. The directive outlines in Article 22, with respect to additional payments, that:

> Before the consumer is bound by the contract or offer, the trader shall seek the express consent of the consumer to any extra payment in addition to the remuneration agreed upon for the trader's main contractual obligation. If the trader has not obtained the consumer's express consent but has inferred it by using default options which the consumer is required to reject in order to avoid the additional payment, the consumer shall be entitled to reimbursement of this payment.

The European Union recognises consumers need to be protected against unscrupulous practices that may result in an inadvertent purchase that is not a necessary part of the transaction. For airlines, they assert additional options may only be purchased on an 'opt-in' basis while for all other distance contracts, the consumer's express consent is required and the vendor may not use default options that require the consumer to reject the option. However, neither piece of legislation defines what is meant by 'opt-in' or what type of constructs are allowed where the consumer must make a decision on an optional extra. There is, however, a definition of 'consent' in the Data Protection Directive [12] relating to the use of an individual's data. Consent is defined as: "any freely given specific and informed indication of his wishes by which the data subject signifies his agreement to personal data relating to him being processed."

While no definition of this nature is included in the Directive on Consumer Rights, it is possible the European Court would deem it an acceptable definition for this directive. However, there is still no indication of what are considered acceptable ways of obtaining consent other than stating the use of default options the consumer must reject are unacceptable. It is therefore at the discretion of the vendor to determine the most suitable method of obtaining consent.

2.2. Research on Option or Choice Framing

According to the classical economic view of rational choice and decision-making, individuals will weigh each alternative according to their preferences or beliefs and choose accordingly. In this model of decision-making, individuals are capable of transitively ranking a set of alternatives, assigning probabilities to the possible outcomes and choosing the alternative that offers the highest expected utility. The rational choice model assumes that neither the order in which the alternatives are presented nor how they are phrased should affect an individual's choice. This theory has been significantly contradicted or inherently questioned by studies from differing fields, presented chronologically below and summarised in Table 1.

Research	Research Study / Application	Summary of Findings
Tversky and Kahneman (1981)	The presentation of preference reversals to two groups from similar backgrounds	The formulation of decisions problems constitutes a significant concern for the theory of rational choice
Kahneman and Miller (1984)	An essay proposing a theory of norms	Challenged the idea that norms are pre-calculated structures and are instead constructed by momentary stimuli
Samuelson and Zeckhauser (1988)	Various experiments using neutral framing and status quo framing	Decision-makers exhibit a significant status quo effect
Levin, Schneider and Gaeth (1998)	A typology of framing effects	Typology helps explain why alternative framing of information affects decision- making
Bellman, Johnson and Lohse (2001)	Internet privacy	How questions are presented to consumers have consequences on choice
Johnson and Goldstein (2003)	Public health	Experiments found defaults make a difference to choice
Lai and Hui (2006)	Internet privacy	Use of opt-in or opt-out can induce different participation levels
Torres, Barry and Hogan (2009) Barry, Hogan and Torres (2011)	Low-cost carrier airline sector in Ireland	Users significantly frustrated by a long series of optional extras presented in an unorthodox manner

Table 1. Summary of research studies on question framing.

Framing of information has been the subject of research from long before the internet era. Tversky and Kahneman [13] theorised framed information could be encoded positively or negatively. In their study, the effects of frames, or framing, on preferences were compared to the effects of 'perspectives on perceptual appearance'. They concluded the dependence of preferences on the formulation of decisions problems constitutes a major concern for the theory of rational choice. Kahneman and Miller [14] went on to develop 'Norm Theory'. In an essay reviewing an extensive body of psychology literature, they proposed the two main functions of norms are "the representation of the knowledge of categories and the interpretation of experience." They challenged the idea that norms are pre-calculated structures and are instead constructed on the fly by momentary stimuli. The implication for this research is that users can be strongly influenced by the context and the presentation of choice. Samuelson and Zeckhauser [15] noted in real-world cases decisions are

often presented with 'influential labels'. They posit there is nearly always one alternative that carries the label 'status quo'. They reported on a series of experiments designed to test for status quo effects. Their key finding was that decision-makers exhibited a significant choice bias towards the status quo. Levin et al. [16] produced a typology of framing effects from an extensive analysis of differing studies and perspectives on framing. The typology distinguished three types of framing effects: risky choice framing; attribute framing; and goal framing. The typology helps explain why the literature has differed on how alternative framing of information in either positive or negative terms affects decision-making. They concluded a deeper understanding of framing effects would benefit from a broader perspective focussing on the "cognitive and motivational consequences of valence-based encoding" [16].

Much contemporary research, albeit not all in the area of e-commerce, has been carried out to determine whether users are more likely to participate when an option is framed as an opt-out rather than an opt-in [8], [17], [18], [19]. They generally conclude an individual is more likely to retain the default option than to change it even if the decision is detrimental to them. That is, they are more likely to participate if an option is presented as an opt-out, rather than an opt-in. Johnson and Goldstein [19] also found there was little difference in acceptance rates between an opt-out and a must-opt (see Section 4.4 for a full explanation and Table 2 for an illustration). The reasons identified for this negligible difference are participant inertia and a perception that the presentation of a default is a recommendation. However, they argued every public policy should have a no-action default.

Other recent studies [6], [20] have examined the impact of question framing on user decisions. In querying how most consumers find, at times, they have opted-in to something they were unaware of, Bellman et al. [20] explained how marketers achieved this 'success'. They suggested using the correct combination of question framing and default answers, firms can almost guarantee consent. In a study they identified different ways in which consent can be obtained and concluded there are consequential effects in how questions are presented to consumers. Lai and Hui [6] conducted research into the impact of question framing on user decisions. Their study indicates the way in which the option is described, as well as the selection mechanism, has an impact on user choice. They found for opt-in decisions using checkboxes, users are more likely to accept an un-selected opt-in over a pre-selected opt-in (see Table 2 for illustrations). They posit the language of acceptance (i.e., referred to in this paper as acceptance framing) inherent in an un-selected opt-in is likely to influence the users' decision (e.g., 'Please send me newsletters' with the checkbox un-ticked versus 'Please do not send me newsletters' with the checkbox ticked).

Finally, Barry, Hogan and Torres [1], found some Irish airlines have responded to the European Union legal requirement that optional extras on airline websites should only be presented to consumers on an opt-in basis, by using questionable web design patterns such as the 'must-opt' presentation of optional extras, whereby the user is forced to accept or reject the item before continuing with the interaction. The study examined user perceptions of the level of compliance of two airlines with the

relevant European Union legislation and found that users were significantly frustrated by a long series of optional extras presented in an unorthodox manner. Neither did they believe the airlines to be compliant with the European Union requirement to communicate all optional extras in a clear, transparent and unambiguous manner. Consistent with an earlier study by Torres, Barry and Hogan [2], the airlines were using decision constructs that framed questions and presented defaults that invariably advantaged themselves and sometimes led users to make choices they might otherwise not have taken.

3. Research Approach

It is necessary, in as far as possible, to identify an exhaustive list of the various decision constructs users encounter when purchasing a product or service whilst on-line and to consider some of the more salient factors that surround the process. As outlined earlier, the authors had noted a number of decision constructs that did not conform to typical design patterns in user interactions in the airline industry [1]. Thus, a study was conducted to examine e-commerce transactions to identify and categorise various forms of decision constructs. It was comprised of two parts as outlined below.

Initially the authors, by means of theorising and analysing websites, proposed an exhaustive taxonomy of decision constructs. The methodology involved identifying the highest-level meta-categories and sub-dividing each logically until a series of mutually exclusive constructs were identified. A large number of retailers' websites were explored and on some, several products or services were studied. This discussion is laid out in Section 4. Secondly, 195 decision constructs during typical B2C encounters across 25 representative B2C websites were examined in detail. A discussion is then presented of the usability issues of some of the more problematic design constructs. The study and discussion are presented in Section 5.

4. Identifying Decision Constructs

4.1. Essential versus Optional Decisions

The transactional process on each website is normally made up of a number of sequential webpages that ends in a payments page. During the process, and after the core product or service has been selected, the user is presented with various decisions points. Most of these decision points relate to real 'options' that may or may not be chosen. The customer will be able to complete the purchase without choosing the option, such as an extended warranty. It is an ancillary aspect of the product or service, usually at an extra cost. However, there are also common decisions that must be made involving some element of choice. Such decisions are 'essential' to obtaining the product or service. Examples of these would be choosing a delivery method or choosing between different payment methods. Thus, the first meta-category of decisions is whether they are essential or truly optional.

4.2. Opt-in versus Opt-out

Optionality proffers an option presented to a user is a straightforward choice; the user either wishes to secure the option or not. The reality is that optionality is far more complex. When the European Union recognised particular problems within the airline industry in how they dealt with the presentation of an optional extra or charge, they produced a directive [10], stating "all optional price supplements should only be accepted by the consumer on an 'opt-in' basis." However, it did not define optionality or what was an opt-in. Some firms appear to have taken great care to reflect considerably on this concept. In seeking to define the notion of optionality, the following were identified:

- Merriam Webster [21] define optional as "involving an option: not compulsory"
- Geddes and Grosset [22] define to opt as "to choose or exercise an option"
- Merriam Webster [21] have no definition for opt-in, but define opt-out as "to choose not to participate in something"
- The Oxford English Dictionary [23] define opt-in as "to choose to participate in something and opt-out to "choose not to participate in something"

A more nuanced consideration is found on wiktionary.org [24] where the following distinction is made between opt-in and opt-out.

- To opt-in – "of a selection, the property of having to choose explicitly to join or permit something; a decision having the default option being exclusion or avoidance."
- To opt-out – "of a selection, the property of having to choose explicitly to avoid or forbid something; a decision having the default option being inclusion or permission."

A distinction is made between opt-in and opt-out that deals more comprehensively with the idea of the outcome of the default option. Thus, most consumers purchasing on the internet are well aware an option is not always presented as an opt-in and at times they have to deliberately choose to opt-out, normally by de-selecting a checkbox or a radio button. Thus, the optional decision may be categorised as either opt-in or opt-out.

4.3. Un-selected versus Pre-selected

In exploring various decision constructs it soon became clear that some opt-in, opt-out and essential decisions were sometimes un-selected and sometimes pre-selected. Some ways in which the decision is presented are quite peculiar. Opt-in decisions normally involve explicitly choosing one of a number of options, thus, an *un-selected opt-in*. However, a *pre-selected opt-in* is more ambiguous. A ticked checkbox, for example, is suggestive of something having been pre-selected for the

user. However, using rejection framing such as 'I do *not* want an extended warranty', the action of un-ticking the box means the user opts-in.

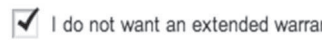
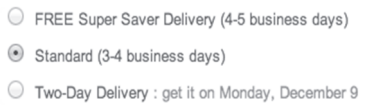
A Taxonomy of Decision Construct		
Decision Construct	**Description**	**Illustration**
Un-selected opt-in	• Default: do not receive option • Normal presentation: un-ticked • Framing: acceptance	
Pre-selected opt-in	• Default: do not receive option • Normal presentation: ticked • Framing: rejection	
Un-selected opt-out	• Default: receive option • Normal presentation: un-ticked • Framing: rejection	
Pre-selected opt-out	• Default: receive option • Normal presentation: ticked • Framing: acceptance	
Must-opt	• Default: cannot proceed • Normal presentation: multiple option variants • Framing: normally acceptance	
Un-selected essential decision	• Default: cannot proceed • Normal presentation: multiple decision variants, all un-ticked • Framing: normally acceptance	
Pre-selected essential decision	• Default: variant selected • Normal presentation: multiple decision variants, one ticked • Framing: normally acceptance	

Table 2. Taxonomy of transactional decision constructs and illustrations.

The juxtaposition of pre-selection (i.e., something appears chosen) against negative framing (i.e., something not being received) is counter-intuitive. So, why design the construct in this way? Perhaps, instinctively, users may quickly de-select an option, thinking they will not receive the pre-selected option. Given the complicated nature of its construction, it is unlikely to simply be inadvertent poor design.

Opt-out decisions normally appear as a pre-selected tick in a checkbox with associated acceptance framing (e.g., 'I want an extended warranty'). However, an opt-out construct can be designed so that it is un-selected, appearing like a 'normal' opt-in decision. This construct requires the decision be framed to imply rejection or

a negation of the decision (e.g., an un-ticked checkbox accompanied by the text 'I do *not* want Collision Damage Waiver'), which is unconventional and extraordinarily confusing. If conventionally used, a user might safely overlook an un-selected option, assuming it to be opt-in. However, the un-selected opt-out construct is designed so a user must tick a box to reverse out of an opt-out decision which may result in the user giving the option more consideration than otherwise. The same juxtaposition can be applied to essential decisions that may be pre-selected (e.g., a fast delivery method) or, more usually, un-selected (e.g., choice of a payment method), see Table 2.

4.4. Must-opt - Neither Opt-in nor Opt-out

Previously, the authors identified and described a new decision construct (i.e., a '*must-opt*' decision) in online transactions [1]. It appeared its use in the airline sector was an attempt to side step the 2008 EU Directive [10] and is certainly inconsistent with good software design practices [4]. A must-opt decision occurs when an optional extra is presented with no option selected, ostensibly an opt-in decision. However, it is not truly an opt-in since it is impossible to progress to the next webpage until the user explicitly accepts or rejects the option; thus, they must-opt. The normal presentation of a must-opt is multiple option variants, one of which allows the option to be declined (see Table 2).

4.5. A Taxonomy of Decision Constructs

From the discussion above, a taxonomy made up of seven decision constructs is proposed in Table 2. While the authors believe they have identified all decision construct types in use across a range of sectors and commercial transactions, in time the number may increase as firms choose increasingly inventive ways of presenting users with optional extras and essential decisions.

5. Descriptive Analysis and Discussion

5.1. Descriptive Analysis

A descriptive analysis of a number of websites accessible to Irish consumers was conducted in order to: (a) determine whether the decision constructs identified are, in fact, used in practice; and (b) determine whether any additional decision constructs need to be added to the list. A total of 25 websites were examined. The websites represented a number of different industry categories: Financial Services, Travel, Consumer Products, Accommodation, and Entertainment & Recreation with between 2 and 9 websites selected from each category (see Table 3).

Encounters by Sector						
Type of Decision Structure	**Financial Service (3 websites)**	**Travel (6 websites)**	**Consumer Products (9 websites)**	**Accom-modation (2 websites)**	**Entertain-ment & Recreation (5 websites)**	**Total Decision Constructs**
Pre-selected opt-in	4	2	0	0	0	6
Un-selected opt-in	20	56	7	18	10	111
Pre-selected opt-out	1	1	4	2	1	9
Un-selected opt-out	3	3	0	0	0	6
Pre-selected essential decision	2	3	6	3	1	15
Un-selected essential decision	3	5	9	2	13	32
Must-opt	2	14	0	0	0	16
Total	35	84	26	25	25	195
Mean number of decisions per transaction	11.7	14.0	2.9	12.5	5.0	10.8

Table 3. Illustrations of transactional decision constructs.

A single representative task was chosen for each website (e.g., rent a car) and each decision point encountered during that transaction was recorded and examined in order to determine whether they could be categorised according to the construct types identified above. Some websites had multiple decision points, while others had very few (e.g., the Travel websites had a total of 84 decisions based on 6 websites whereas consumer products had 26 decisions based on 9 websites (see Table 3). The overall mean number of decision constructs for each transaction was 10.8.

For the Travel, Accommodation and Financial Services websites, the mean number of decisions encountered per transaction was considerably higher than for Consumer Products and Entertainment & Recreation (see Table 3). The high number of decision points on both the Travel and the Financial Services websites is due to product deconstruction, now common in both sectors. This approach was also apparent in the Accommodation websites, with hotels offering multiple options, often at additional charge (e.g., flowers or wine in the room). However, Accommodation websites tended to offer the options in a simple un-selected opt-in format, whereas Financial Services and Travel websites used more complex structures such as pre-selected opt-ins, un-selected opt-outs and must-opts. The difference in approach meant while there were many options presented on the Accommodation websites, a user could easily traverse the website without paying

too much attention to the options. Ignoring the options meant the user simply purchased the base product without additional options.

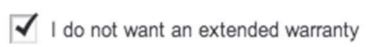
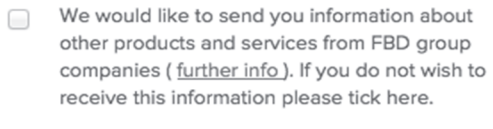
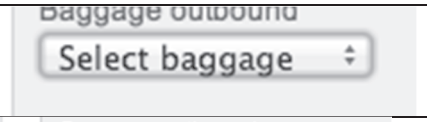
Presentation	Illustration
Pre-selected opt-in	
Un-selected opt-out	
Must-opt using radio buttons	
Must-opt using a drop-down menu	
Must-opt drop-down menu once clicked on	

Table 4. Presentation of non-standard transactional decision constructs.

In contrast, the more complicated decision constructs used by Financial Services and Travel websites made traversal of those websites more complicated, requiring careful scrutiny of the options offered in order to avoid inadvertent purchase. These included:

- Pre-selected opt-ins, where the user needs to do nothing in order to avoid purchase (see Table 4). This construct requires more attention by the user as they may assume that a ticked box is an opt-out. If the user proceeds under this assumption and quickly de-selects without reading the text closely, they would inadvertently choose the option. This construct is made even more complex by the necessary use of negative framing that requires careful attention in order to fully grasp the meaning of the text.
- Un-selected opt-outs, where the user needs to 'tick the box' in order to avoid the purchase (see Table 4). This construct is complex for similar reasons to the pre-selected opt-in as it is a non-standard format. The normal format for an opt-out is a pre-selected opt-out where the user deselects in order to indicate they do not wish to select an option. A hurried user could easily presume an un-selected checkbox is, in fact, an un-selected opt-in, resulting

in inadvertent selection of the option. The negative framing also requires considered attention to fully understand the option.

- Must-opts, where the user must, for example, tick a box, indicating whether they wish to choose an option or not in order to continue with the transaction. While this format is less likely to result in inadvertent selection of an option, it does require that the user consider the option and then indicate whether they wish to select it or not.

A user could be easily forgiven for mistaking the must-opts in Table 4 for un-selected opt-ins, as there is no indication the user must take action in order to make a decision. In the case of the radio buttons it would be reasonable for the user to presume that they were not required to consider the options unless they wished to add a driver. In the case of the drop-down menu, the user could also reasonably presume that no action is required unless they intend bringing checked-in luggage. Once the user clicks on the menu, it is more apparent action is required. However, if the user has continued with the interaction without engaging with either of these must-opts, they will have no indication that action is required until they attempt to proceed to the next page. At this point, they will be informed they must specify whether they wish to add additional drivers or whether they wish to bring checked-in baggage.

In addition to the use of non-standard formats, some of the websites use a variety of constructs for options. For example, an un-selected opt-in might be presented just before an un-selected opt-out, with the user having to pay close attention to ensure they fully understand the options. The Travel websites also managed to introduce additional potential confusion by presenting the must-opts in multiple ways during a single transaction. For example, one must-opt could be presented as a drop-down menu, with the next must-opt presented using radio buttons arranged horizontally, and a third must-opt presented using radio buttons arranged vertically. This design requires the user to pay close attention to all options, as they can never be sure what type of construct they have encountered until it has been examined carefully and the consequences of action or inaction considered.

5.2. A Preliminary Discussion of Usability Issues with the Decision Constructs

The authors examined all decision constructs to determine the likelihood that users would understand the type of construct encountered. As can be seen from Table 3, the un-selected opt-in was the most commonly encountered decision construct. These constructs were, in most cases, obviously opt-ins. However, there were a number that were presented in a way that was sub-optimal. These tended to use a less common presentation format and so, might not be as obvious to the user. In the case of un-selected opt-ins that were presented to the user via checkboxes and drop-down lists it would generally have been obvious that this was, in fact, an un-selected opt-in. It was clear that if the option was desired, the user should tick the checkbox or click on the drop-down list in order to see the choices available. The clarity of the construct type was largely due to the wording and the way in which the option was presented. For example, in the case of drop-down lists, the default option presented

to the user was typically 'none'. This presentation clearly indicated, if the user took no action, they would not avail of the option, and conversely, if they wished to avail of the option, they should take action.

In contrast, the un-selected opt-ins that were less obviously opt-ins tended to be presented using more unusual presentation formats, such as command buttons or interactive maps. One un-selected opt-in presented using a command button, viewed in isolation, would probably be clearly interpreted as an un-selected opt-in. However, its position on the page (i.e., it was located on a part of the page that was not obviously associated with the purchase) and the graphics used were more suggestive of an advertisement than an option associated with the purchase. A second example of an unclear un-selected opt-in was an interactive map for seat selection on an airline website. In this example, there was no indication the user should click on a seat number if they wished to reserve a particular seat. The user could conceivably attempt to progress to the next page without realising they could reserve a seat on this page. The first indication was a message displayed asking them to confirm they did not wish to reserve a seat when attempting to continue to the next page.

There were few pre-selected opt-ins encountered. Radio buttons were used in the majority of those, with one using a drop-down menu. The pre-selected opt-ins were generally clear and obvious, as the default stated the option was not required and the layout was such that it would be obvious to a user what the default was and what action would be required to avail of the option.

The essential decisions were predominantly clear. However, one pre-selected essential decision on an airline website was less obvious, as it used command buttons to choose between different fare types with the least expensive type pre-selected. It was an unusual button format where the buttons were not obviously separate and did not clearly offer options from which to choose. In this example, the default was the cheapest option. However, this was not the case for all the pre-selected essential decisions as the cheapest option was not always obvious to the user. In contrast, other companies were more upfront and clearly indicated to the user the default option was more expensive.

The majority of the must-opts encountered used radio buttons, with a small number of drop-down menus and command buttons used. In many cases it was obvious the user must take action, as the option was phrased as a question and prompted the user to interact with the construct. However, in certain cases, particularly where there were a number of different decision constructs located close together, the presentation tended to be more ambiguous. This ambiguity was mainly because the user had to negotiate a number of opt-ins and opt-outs (i.e., neither of which require user action, as there is a default option) in close proximity to the must-opts. In some cases, the phrasing of the must-opt could also lead to confusion. For example, on one airline drop-down list, the name of the option (i.e., 'Select Baggage') was displayed initially. A user might reasonably presume no action was required unless they wished to check-in baggage. It only became apparent when the menu was clicked that action was required regardless. As such, the must-opt presented could result in a user ignoring the interaction because they did not intend

to check-in baggage. They would, however, be informed of the 'error' when attempting to progress to the next page. Therefore, while a user may erroneously ignore a must-opt, they will not make an inadvertent choice or selection, as they are required to make their decision explicitly before continuing to the next page.

The opt-outs were presented as either un-selected or pre-selected with relatively small numbers of each. Both pre-selected and un-selected opt-outs were only presented using checkboxes. Most of the opt-outs were used for the purpose of signing users up to mailing lists or to receive special offers. However, two of the pre-selected opt-outs were for products or services. Under the new EU consumer protection legislation [11], additional payments above and beyond the minimum cost of the transaction require the explicit consent of the consumer. These two pre-selected opt-outs would therefore appear to violate the legislation. The other pre-selected opt-outs did not involve an additional cost, and so, did not contravene legislation.

Opt-outs are most commonly presented as pre-selected, with text indicating that the user is accepting the option, requiring an action in order to decline the option. The text, in the cases encountered, used acceptance framing and tended to be quite clear as to the result of retaining the option. This design would likely ensure the user could easily determine the best option to take.

In contrast, the un-selected opt-outs encountered were less clearly identified as opt-out constructs. They were all presented using un-selected checkboxes, more conventionally used for opt-ins. The associated text was presented using rejection framing, and would generally require careful reading in order to ensure the correct action is taken. For example, one website had the following text alongside an un-selected checkbox: "We would like to send you occasional emails about our services, including our best online deals. If you would rather not receive this information then please tick this box." A quick glance at the construct could easily result in a user misinterpreting it as un-selected opt-in. While the text begins by positively reinforcing the pre-selection (i.e., suggestive of an opt-in), it is only on careful reading that the user would realise they were required to actually tick the box in order to decline the option.

One un-selected opt-out used much clearer language (e.g., "I do not wish to be contacted via post by … in relation to other products or services".) Reading the text in isolation would be unlikely to result in a misinterpretation of the construct type. However, the un-selected opt-out regarding contact via post was placed in close proximity to two un-selected opt-ins regarding contact via phone and e-mail respectively, all in a single frame with a single heading regarding communication preferences. A user could easily read one, presume the others were the same type and respond accordingly by quickly ticking all three checkboxes in order to avoid communication via post, phone and e-mail. However, they would only achieve their goal of avoiding postal communications but would fail in avoiding phone or e-mail communications.

The majority of decision constructs encountered were, in the opinion of the authors, clear and obvious and would be unlikely to result in the user misinterpreting the construct type. In most cases, it would appear that firms wished to ensure their

customers had a straightforward interaction with the website and achieve their goals without errors. However, a small number were not obvious. These were either construct types that were rarely encountered or ones that used unusual formats. In many of these cases, the user could be forgiven for thinking the firm was trying to trick them into an inadvertent purchase or signing up for undesired future contact.

In other cases, the confusion could be interpreted in a more benign fashion. Some of the unusual presentation formats, such as an interactive map, might be to provide interest and variety on the website through the use of graphics rather than an attempt to deceive the user. This idea of variety is further reinforced in some instances, as the user may not realise the graphic is interactive, mitigating the opportunity for the firm to generate additional revenue.

6. Conclusions

This study set out to identify all possible ways in which essential and optional decision constructs can be presented to a user in on-line transactional processes and then proceeded to examine whether the constructs are used in practice and to identify any additional constructs that had been missed in the initial process. The genesis for the research question was to explore whether firms were acting in good faith in relation to consumer protection regulations. As noted earlier, the EU has recognised that programming constructs are being used to nudge consumers to behave in a way that airlines wish and have recently enacted additional legislation that applies to all distance contracts.

Much of the research that contradicts the theory of rational choice discussed above supports the notion of the 'appeal of defaults' [6]. From the more recent internet or e-commerce related studies it is clear that users are being confronted by websites that can inhibit privacy, frame questions and present defaults that serve to disadvantage users and advantage firms. Furthermore, some of the practices appear intentionally surreptitious and confusing.

Based on this study, the authors believe they have captured all the decision constructs presently in use. The descriptive analysis of the incidence of decision constructs from the taxonomy shows that they range across all sectors and a large variety of decisions. It is evident from the results of the study that firms, in most cases, are using obvious decision constructs that allow the user to make quick decisions that require little deliberation or thought. Sectoral difference, namely in Travel, Accommodation and Financial Services, were evident in the mean number of decisions per transaction. However it was the Travel and Financial Services sectors that stood out in using more unusual and more complex constructs such as the must-opt, the un-selected opt-out or the pre-selected opt-in for certain options.

In the discussion on clarity in Section 5.2, it was evident that most decision constructs were presented in a clear and obvious way. Users could scan easily, decide quickly, and get on with concluding the transaction. Once users have made a commitment to purchase they do not want to hang around. However, it was equally evident that the more unusual constructs are being used in several sectors. Furthermore, with the must-opt and other ambiguously presented decisions, it is

clear EU regulations deal with the notion of optionality inadequately. It is difficult to assign definitive motivations for the appearance of these constructs, but what is obvious is that these firms are making clear and deliberate decisions to present choice in this way. Their decisions are against good design principles, the 'natural' option construct and counter to the delivery of a satisfying user experience. Take the case above presenting a choice of receiving regular emails from a firm. Looking just like an un-selected opt-in, it was in fact an un-selected opt-out. In the view of the authors, the firm set out with intent to disguise one 'ordinary' construct as another construct altogether, calling for quite different interaction. If this case and many others are deliberate, then the conclusion must be the purpose is in order to increase the likelihood of the user selecting the option. This approach is more than 'nudging' the user; it is surreptitious and underhanded. It would appear, in certain instances, the consumer needs to pay close attention to all decisions encountered if they are to successfully negotiate the obstacle course placed in their path throughout the course of a transaction.

It is likely firms will continue to behave inventively, as they seek ways of attracting users attention to various ancillary products and services. The theory of cultural lag identified by Ogburn [25] is resilient and remains a significant phenomenon and challenge. Firms are using new technologies to shape user behaviour in their favour; researchers and regulators should take note.

7. Further Research

A number of issues emerged that will contribute to further research. Some of the constructs were encountered infrequently, while others were more prevalent. The number of websites examined will need to be expanded considerably in order to carry out statistical analysis on the results. Additionally, the preliminary discussions in Section 5.2 will form the basis of a more detailed analysis of the individual constructs and their impact on user interaction. Factors such as ease of use, level of persuasion, clarity and trust will be key dimensions of the study.

References

[1] C. Barry, M. Hogan and A. Torres. "Perceptions of Low Cost Carriers' Compliance with EU Legislation on Optional Extras." in *Proceedings of the 20th International Conference on Information Systems Development*, 2011, pp. 669-680.

[2] A. Torres, C. Barry and M. Hogan. "Opaque Web practices among low-cost carriers." *Journal of Air Transport Management*, vol. 15, pp. 299-307, Nov. 2009.

[3] Y. Rogers, H. Sharp and J. Preece. *Interaction Design: Beyond Human-computer Interaction*. Chichester, UK: John Wiley, 2011.

[4] B. Shneiderman and C. Plaisant. *Designing the User Interface: Strategies for Effective Human-Computer Interaction*. Boston: Addison-Wesley Publishing, 2010.

[5] J. Sklar, *Principles of Web Design.* London: Thomson Learning, 2006.

[6] Y. Lai and K. Hui. "Internet Opt-in and Opt-out: Investigating the Roles of Frames, Defaults and Privacy Concerns." In *Proceedings of SIGMIS-CPR'06,* 2006, pp. 253-263.

[7] G. Ahmetoglu, S. Fried, J. Dawes and A. Furnham. "Pricing Practices: Their Effects on Consumer Behaviour and Welfare," Office of Fair Trading, London, UK, Tech. Rep., 2010.

[8] B. Madrian and D. Shea. "The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior." *The Quarterly Journal of Economics,* vol. 116, pp. 1149-1187, May 2001.

[9] European Union. 2002/58/EC. *Directive on Privacy and Electronic Communications,* 2002.

[10] European Union. 1008/2008. *Regulation of the European Parliament and of the Council on Common rules for the Operation of Air Services in the Community (recast),* 2008.

[11] European Union. 2011/83/EU. *Directive on Consumer Rights*, 2011.

[12] European Union. 1995/46/EC. *Data Protection Directive*, 1995.

[13] A. Tversky and D. Kahneman. "The Framing of Decisions and the Psychology of Choices." *Science,* vol. 211, pp. 453-458, Jan. 1981.

[14] D. Kahneman and D. Miller. "Norm Theory: Comparing Reality to Its Alternative." *Psychological Review*, vol. 93, pp. 136-153, Apr. 1986.

[15] W. Samuelson and R. Zeckhauser. "Status Quo Bias in Decision Making." *Journal of Risk and Uncertainty*, vol. 1, pp. 7-59, Mar. 1988.

[16] I. Levin, S. Schneider and G. Gaeth. "All Frames Are Not Created Equal: A Typology and Critical Analysis of Framing Effects." *Organizational Behavior and Human Decision Processes,* vol. 76, pp. 149-188, Nov. 1998.

[17] C. McKenzie, M. Liersch and S. Finkelstein. "Recommendations Implicit in Policy Defaults." *Psychological Science,* vol. 17, pp. 414-420, May 2006.

[18] C. Junghans, G. Feder, H. Hemingway, A. Timmis and M. Jones. "Recruiting Patients to Medical Research: Double Blind Randomised Trial of "Opt-in" Versus "Opt-out" Strategies." *British Medical Journal*, vol. 331, pp. 940-943, Oct. 2005.

[19] E. Johnson and D. Goldstein. "Do Defaults Save Lives?" *Science,* vol. 302, pp. 1338-1339, Nov. 2003.

[20] S. Belman, E. Johnson and G. Lohse, "To Opt-In or Opt-Out? It Depends on the Question." *Communications of the ACM,* vol. 44, pp. 25-27, Feb. 2001.

[21] Merriam-Webster Dictionary. http://www.merriam-webster.com/dictionary/optional; http://www.merriam-webster.com/dictionary/opt%20out [Jul. 23, 2013].

[22] Geddes and Grosset. *Webster's Universal English Dictionary*, 2004.

[23] *The Oxford English Dictionary*, 2013.

[24] Wiktionary. http://en.wiktionary.org/wiki/opt-in [Jul. 12, 2013].

[25] W. Ogburn. "Cultural Lag as Theory." *Sociology & Social Research,* vol. 41, pp. 167-174, Jan. 1957.