Design with Intent:
Persuasive Technology in a Wider Context

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Abstract. Persuasive technology can be considered part of a wider field of 'Design with Intent' (DwI) – design intended to result in certain user behaviour. This paper gives a very brief review of approaches to DwI from different disciplines, and looks at how persuasive technology sits within this space.

1 Introduction

Persuasive technology (PT) is an example of design intended to result in certain user behaviour [8, p.1]: it is strategic, with defined behavioural outcomes in mind. Broadly reviewing the idea of using design to modify behaviour, a spectrum of approaches emerges; a common factor is designer *intent*, and thus the term *Design with Intent* (DwI) can be used. This paper aims to explore briefly how PT fits in this context of DwI, as a background to understanding more about its boundaries and potential.

2 Perspectives on Design with Intent

Approaches to DwI have differing terminologies and philosophies, but techniques from one discipline may be applied usefully in another. For example, the authors' research is in ecodesign, creating and testing the efficacy of products which 'cause' users to operate them more efficiently, informed by perspectives from different fields.

2.1 A Review of DwI Across Different Fields

Affordances and Constraints. In HCI and product design, expressions of DwI relate to *affordances* and *perceived affordances*, as outlined by Gibson [9] (and developed by Norman [23, pp.9-11]): the interactions facilitated by a product, system or environment, and shaping users' perception of what actions are possible.[1] When the aim is intentional shaping of user behaviour, the term *behaviour-shaping constraint* is often used: constraints such as *forcing functions* (e.g. interlocks [23, pp.131-40, 203-6]), may be used alongside tactics such as selection of defaults [15] or making certain

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[1] The slight disparity [20] between Gibson and Norman's definitions was later clarified by Norman [24]: his area of focus would be better termed *perceived affordances*.

actions deliberately more difficult – *slanty design* [4]. Programmed learning, such as teaching machines [30], uses forcing functions to persuade users to solve problems.

Poka-yoke. In manufacturing, *poka-yoke* (Japanese: 'mistake-proofing') encompasses defensive design techniques developed by Shingo, originally intended to make 'zero defects' achievable in assembly processes [29]. In general, these can be classified as 'control' or 'warning' poka-yokes: control poka-yokes are constraints which force 'correct' behaviour – e.g. the bevelled corner on memory cards and 3½" floppy disks – while warning poka-yokes reduce errors by alerting users when an incorrect step or condition occurs. There is an overlap with persuasion techniques such as reduction, tunnelling and *kairos* [8, Ch. 3] in terms of making correct behaviour 'easier'.

Philosophical Approaches. *Behaviour-steering design* has been proposed by Jelsma [11], following Akrich and Latour's discussions of 'scripting' behaviour into artefacts [1, 16]. Jelsma gives an example of a dual-button toilet flush, scripting users to decide on their water usage [11]. Some 'design for behavioural change' research incorporates scripting [e.g. 18]. A *rhetorical* approach, outlined by Buchanan [6], holds that *all* design incorporates an argument or usage intention; as Redström [27] suggests, this may imply that all design is 'persuasive'.

Built Environment. Winner's question [33], "Do artefacts have politics?" is generally applied pejoratively to architectural examples, notably Moses' low parkway bridges [7] (preventing bus access, discouraging poorer visitors to a state park[2]). A ubiquitous example is the park bench with central armrest discouraging overnight occupation (e.g. by the homeless [19]). Approaches [e.g. 13] in the vein of Alexander's work [2], use *defensible space* [22], *natural surveillance* and *sociopetal* seating [31] to deter crime and encourage interaction. *Traffic-calming* draws from visual perception to shape behaviour, as does retail environment design: *planograms* [32], floorplans and *retail atmospherics* [28], can be used to route customers, persuading them to make certain purchases.

Digital Environment. Using architecture (of a system or space) to regulate user behaviour – *architecture of control* – has received much attention in digital contexts [14], where Lessig [17] popularised the "code is law" concept. The prevalence of *technological protection measures* (e.g. digital rights management) confirms that design promoting adherence to business models is on some corporate agendas; there is commonality with security, where the aim is to constrain user behaviour. Network architecture and *traffic-shaping* permit price discrimination [25], encouraging certain behaviours economically.

Other Commercial Strategies. Aside from advertising itself, DwI intended to extract greater value from consumers ranges from the reinforcement of the MOPy screensaver noted by Fogg [8, p.228], to the *razor and blades model*, where a product locks users into repeat consumable purchases. Electronic authentication, such as the *handshake chips* in some printer cartridges, extends this business model. Commercial DwI strategies also include *planned obsolescence* [26], persuading consumers to purchase replacements, and *anti-features* [10], intentionally degraded to persuade buyers to pay more for a 'better' model – 'artificial' product differentiation.

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[2] Later research casts doubt over Moses' supposed intentions and the bridges' height [e.g. 12].

2.2   How Persuasive Technology Fits with DwI

Much PT research focuses on persuasion with intended *social* benefit – from encouraging exercise [e.g. 21] to reducing energy use [e.g. 3], but in the wider DwI field, the intent is often *commercial* benefit. The aims are not mutually exclusive: e.g. a recycling company persuading users to recycle can have both social and commercial benefit intent. Hence it might be sensible to consider *intended social benefit* and *intended commercial benefit* as orthogonal dimensions of the DwI space (Figure 1). Another aspect is whether the *impact on the immediate user* is 'helpful' (the third dimension in Figure 1): e.g. making it difficult to put a TV on standby embodies social benefit intentions (energy saving), but will inconvenience individual users. This area is shown in grey in Figure 1, and is likely to contain more controversial examples; 'intended social benefit' itself will also be controversial in cases where the intent is politicised.

The dashed line thus suggests an approximate domain for PT in the DwI space, at least based on literature to date: centred *on intended social benefit*, usually (not always) *helpful to the immediate user*, and possibly with *intended commercial benefit*.
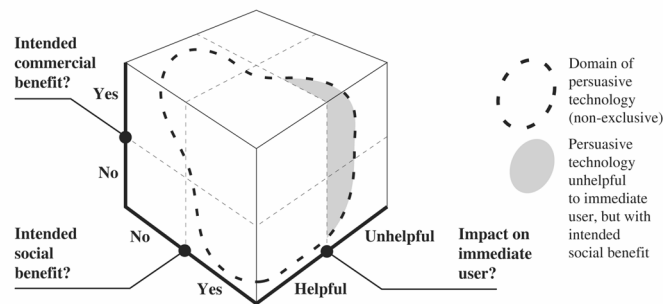

Fig. 1. Some possible dimensions of the wider DwI space, and how PT fits

The diagram only illustrates three possible dimensions, and does not address characteristics such as the degree of 'coercion' involved in a technique. This is a difficult semantic issue to consider definitively, since while 'persuasion' in a PT context is defined to exclude coercion [8, p.15], it is recognised that "the line between persuasion and coercion can be a fine one" [8, p.21]. In the wider field of DwI there are many examples (e.g. anti-homeless benches) where a more coercive intent is demonstrated. If, as Redström [27] argues, all design is persuasive, then coercive design may simply be an 'unethical' subset, with its boundaries inevitably subject to analysis [e.g. 5], debate and possible revision.

3   Conclusions

While brief, it is hoped that the above review of the DwI field forms a useful and interesting background for further work in exploring how PT fits in this context of designing behaviour change. The main contribution is perhaps to bring an awareness

of different DwI perspectives to PT researchers, with the possibility of informing or inspiring new strategies on further investigation.

Future work from the authors will expand on a range of persuasive design techniques for causing users to operate products in a more sustainable manner: selecting these, designing the systems, and testing their efficacy in user trials.

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