

Load while Aiming; Hit?

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Abstract

Usability and now UX specialists aren't in charge and shouldn't be. Design strategists should lead project teams to focus on a common purpose rather than squabble over competing value systems. Evaluating too should have only one purpose: to evaluate design purpose. In this keynote address, I will introduce *worth-centred* approaches to digital products and services. These focus on worth as a balance of benefits over

costs for all included stakeholders. Worth-Centred Development (WCD) takes designing to a point where a focus on *intended* worth can progress to *achievable* and on to *achieved* worth. The evolving WCD framework combines approaches in support of six meta-principles that are necessary and sufficient to enact designing as it ought to be. Example approaches such as worth maps,

element measurement strategies and user experience frames are briefly illustrated to show how we must and can move beyond user experience to focus on achieving outcomes in the world as the primary purpose of all designing.

Keywords

Value, Worth-Centred Development, Designing, Worth Maps, User Experience,

1.0 Who Would Aim First

An artillery battery commander's cries of "Load", "Aim" and "Fire!" sequence a shot at a known enemy. An artillery piece must be ready to fire, so there is no point of "aiming" before "loading". Yet, from the dawn of HCI, usability specialists have wanted to get in 'early', before anyone has made any commitments to artillery or munitions. "Aim", "Load", "Fire!" was HCI battery commanders' sequence. Initially, even "load enough to fire at something" will do. We had to get in first, take charge, and stay in charge (Cockton 2008b). Who would go into battle with battery commanders who must see where to aim *before* knowing what sort of artillery exists and what it can do?

Designing is not warfare, however much it feels like this in the trenches of software development. We are not firing at enemies, but aiming for allies. We need to know them well to know if our aim is true. We must gather human intelligence needed to assess success. Nevertheless, such human intelligence has to be co-ordinated *alongside* gathering techni-

cal intelligence to support delivery of designs. Technology can't and won't wait. UX planning needs to proceed alongside exploration of technical and creative opportunities

2.0 Load and Aim

UX specialists can never get in 'first'. Technology creatives will have always invented, tinkered and bootstrapped long before any UX involvement. We must shadow technology development, looking for good places to aim at while engineers and creatives make things to load and things to load them in. Designing must thus support parallel activities. Some will focus on technical and creative *means*. Others will focus on human *ends* and experiences. Means and ends must be explored, compared, selected and refined in parallel. The required co-ordination can be achieved through an integrating focus of *worth* that aligns user research, design and evaluation.

3.0 Hit?

Back at battalion HQ, officers direct batteries, updating their plans in response to (un)successful hits and moving targets. Their remote view yields very different perspectives from those formed in during batteries' moment by moment activities.

With little sense of any overall battle plan, a battery UX evaluator could do little more than focus on how guns are fired. How fast can they load, aim and fire? What sorts of errors get made? Who gets injured and how? How does the battery feel about their performance? What's it like to fire guns? What improvements are sought?

A battery evaluator returns to battalion HQ with their UX report. No-one at HQ cares. None of it matters. They win battles and are winning the war. They'd like to win it quicker, with less damage, making the inevitability of defeat clear. Their aim is less vanquishing the enemy than receiving their surrender.

Measuring artillery UX has limited connections with effecting surrender. Every

shot is a cost. Peace on our terms is the benefit. Battery evaluators see mostly costs and few benefits.

4.0 Miss!

Measuring the wrong things in the wrong place at the wrong time is hard to value. There is no point in measuring efficiency or effectiveness (as task completion) if they don't matter. UX work can be equally pointless by measuring emotions without regard for how they contribute to worthwhile outcomes within or after interactive experiences.

There is limited, if any, summative value in, measures of what are *means to ends*. Such measures capture little of the complete means-end chains that shape how, when and why means enable ends.

Designers are often no better, also focused exclusively on means and never firming up on ends. If designing has no clear purpose, then so too will evaluation focus on means, not ends.

5.0 Better by Designing?

The lessons from the artillery example are that we must not aim before loading, and that we must be able to see our targets and know whether we have hit them. However, we cannot rely on a remote battalion HQ to tell us where to aim and whether we are hitting the target. We need to combine the battery and the battalion HQ in an integrated approach to design management.

UX must be an integral part of development, but when integrated into the wrong process, poor UX downstream utility gets blamed for upstream futility (Cockton 2007). UX can't be expected to fit into any development process and deliver regardless. Development has to be open to *designing* to let UX effectively support development of worthwhile digital products. Designing, if and when

comprehensive, lets us load, aim, fire and check the result.

Designing as a human activity will always be subjective. Its norms and ethos arise from the nature of design outcomes, which "result from ... decisions ... Choice implies alternatives, in how ends can be achieved, and for whose advantage. ... design is not only about initial decision or concepts by designers, but also about how these are implemented and by what means we can evaluate their effect or benefit" (Heskett 2002, pp. 5-6).

There are thus key design choices of:

1. Means from alternatives
2. Ends (design purpose)
3. Beneficiaries (stakeholders)
4. Means of evaluation

A development process must explicitly support and co-ordinate all four types of design choice. If not, it does not support designing, and at best is a process of creative making. Support for norms of designing can be expressed as expectations for development processes. Such expectations can be expressed in specific contexts as principles, which instantiate more general *meta-principles*. Six such meta-principles are necessary and sufficient to support designing's four key choices:

1. Commitment
2. Receptiveness
3. Expressiveness
4. Inclusiveness
5. Credibility
6. Improvability

These meta-principles are holistic.

Commitment requires project teams to overtly select means, ends, beneficiaries and evaluations.

Receptiveness requires being creatively open to alternative means, ends, beneficiaries or evaluation methods.

Expressiveness requires effective representation of chosen means, ends, beneficiaries and evaluations, associations between intermediate means, and between terminal means and ends.

Credibility needs feasible means, genuine ends for beneficiaries, relevant evaluations, and plausible linking associations within means-end chains.

Improvability needs measurable means and ends, evaluation instruments to measure them, targets to hit, and chances for more inclusiveness and (recursively) more improvability.

Inclusiveness requires moral or ethical justification of inclusion and exclusion of stakeholders; for included stakeholders, costs arising from chosen means must be justified, as must benefits associated with chosen ends, and also the ability of chosen evaluations to properly assess the *balance of worth* resulting from achievable benefits given likely costs.

Project teams can partially instantiate these six demanding meta-principles via an appropriate framework. It is only within specific development contexts that principles can be fully instantiated.

A *Worth-Centred Development* (WCD) framework is evolving to support partial instantiation of the six meta-principles. It is worth-centred, because it constructs designing as the creation of worth, and not just of value or of artefacts. Many credible value propositions fail because they do not offer sufficient value to offset a wide range of costs. Price is one cost, but others may be more important, such as the cost of usage, ownership, integration of substitution. The latter two costs are particularly important for digital products and services, which must have good synergies within existing product-service ecosystems. Also, switching costs must be acceptable. Together, these costs can make even the most apparently valuable design *not worth it*.

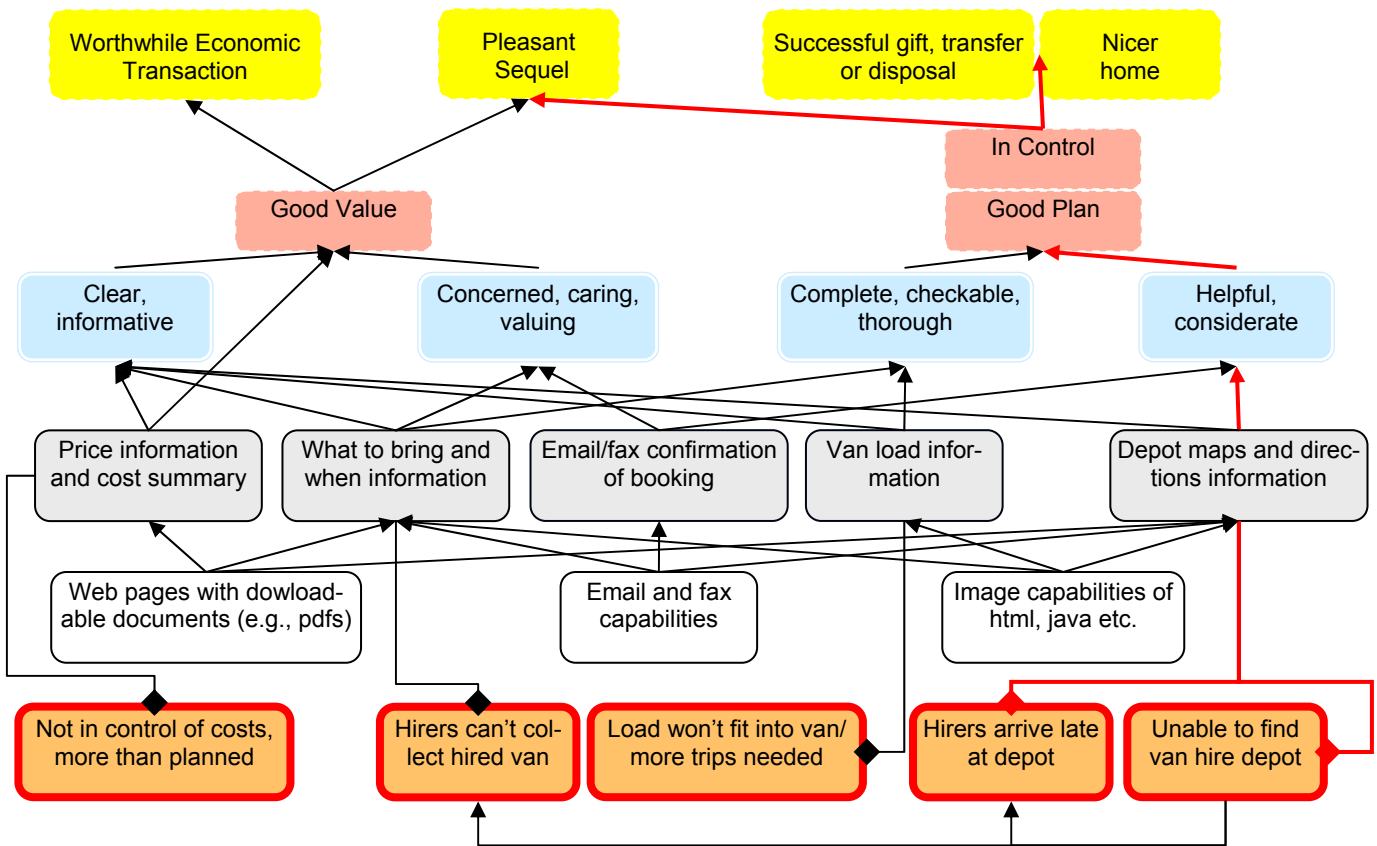


Figure 1. Worth Map for Hypothetical Van Hire Site.

Worth is thus the *arbiter* of product or service success. Value is a *motivator*, but costs can de-motivate. We need to focus on the balance of costs and benefits to promote design success.

6.0 The WCD Framework

The WCD framework has been populated by adapting existing HCI approaches and borrowing from consumer psychology and ethnography to fill gaps. They are called *approaches* rather than methods, since they are tactical resources, often supported by diagrams or tables. However, no fixed procedures are associated with these tactics or representations. Due to space limitations, three approaches are briefly illustrated, and several further ones are noted.

6.1 Worth Maps

Worth Maps adapt hierarchical value models (HVMs) from consumer psychology. Cockton (2008a) covers their predecessor, *worth/aversion maps* (W/AMs), which were closer to HVMs. Worth maps combine envisaged means-end chains (MECs) into a network diagram. They support instantiation of commitment by presenting chosen means and ends in MECs that end at worthwhile outcomes. Means, ends and associations between them are shown in worth maps.

Figure 1 shows a worth map for a van hire web site, mostly from a customer perspective. The map is populated by *design elements* (materials, features, qualities) and *value elements* (user experiences, outcomes). Element colours are: yellow for *worthwhile out-*

comes, pink for *user experiences*, light blue for *qualities*, grey for *features*, white for *materials*, and red edged for *adverse outcomes*. Other negative elements (defects, adverse experiences) are omitted for simplicity. Closely adjacent unassociated elements (no arrow links) are (non-exclusive) alternatives (horizontally adjacent) or sequenced (vertically adjacent). Outcomes are *ends*. All other elements are *means*. An example MEC is highlighted in red.

Worth maps express *intended worth* for chosen beneficiaries and the means that are expected to deliver it (see further details in Cockton 2008c). Worth maps express a project team's *commitment* to specific ends and the means that can achieve them, and to associations between these map elements. Commitment to beneficiaries can be indicated by associating included stakeholders

with specific experiences and outcomes. Commitment to evaluations is expressed through element measurements strategies, which plan for testing of whether loading and aiming resulted in any hits.

6.2 EMSs and DWI

An *Element Measurement Strategy* (EMS) associates measures, instruments and thresholds with each element of a worth map. The main requirements for summative evaluation are to measure achievement of worthwhile outcomes. In Figure 1, these are: a worthwhile economic transaction, a pleasant sequel, successful gift/transfer/disposal and/or nicer home). Adverse outcomes should also be measured. In Figure 1, these are: costs out of control, arrive late, load won't fit, can't collect van/ find depot). The diamond ended arcs in Figure 1 are *aversion blocks*, which express claims that associated design elements will prevent adverse outcomes. Measures can test such claims establishing the *achieved worth* of the current design.

UX evaluation has focused on usage, yet many worthwhile outcomes that represent the true ends of design purpose cannot be measured during use of digital components of a wider product or service system. Most outcomes in Figure 1 need instrumentation at van hire depots, where data would be provided directly by customers/and or depot staff. Other outcomes, and user experiences, require instrumentation of customers soon after a hire, again either with data provided directly at the depot by customers and/or staff, or via customer feedback web pages, phone or email surveys. The 'moments of truth' of all outcome measures are such that none can be measured through web-site user testing, and most cannot be fully measured until a customer has completed removal of goods, or abandoned delivery for some reason.

Feelings	Beliefs	System Usage	System Response	Acts in the World
Looking forward to getting van	Have all necessary details			
				Staple and pin up
		Print pdf		
		Read email, follow link to pdf	Display pdf	
Feels great, all well planned now	Booked right van for right time period	Save and print confirmation page		
			Display and email confirmation	
		Book and pay for van		Sally checks details
	Can find right van	Select appropriate van	Display book this van page	
				Harry sees ok van
		Select depot	Update depot info	
That's cool	Nearest depot is on ring road			
		Enter Post Code	Show depots map	Sally sees nearest depot
Better to start with depot	Can find info on depots			
				Sally persuades Harry
Not a good place to start	Can find prices and availability			
			Display home page	
		Open lovely-van.com		

Figure 2. *Good Plan* Customer UEF for a Van Hire Web Site

Direct Worth Instrumentation (DWI) is an evaluation approach that embeds instruments in technical or wider socio-digital systems. This may require extensions to initial design elements, e.g., email based feedback requests linked to survey webpages. Systems at a van hire depot could also be extended to track frequency and causes of late pick ups and drop offs (e.g., getting lost on the way to the depot), or inappropriately sized hired vans (both

too small and too large). The motivation is always to measure what matters, and not what is easy to measure.

6.3 User Experience Frames

User Experience Frames (UEFs, Cockton 2008d) expose the internal detail of UX worth map elements. UEFs adapt multi column transcripts from ethnographic research (Jordan and Henderson 1995) to express design commitments and expectations *before* there

is an implementation that can let representations be based on actual usage. In contrast, both HVMs and ethnographic transcripts are based on data from users/consumers with actual product experience, and must thus be created *after* implementation and/or deployment.

Figure 2 shows an illustrative UEF for the *Good Plan* UX in Figure 1. It has five columns for the feelings, beliefs, user actions, responses and human actions within a specific abstract scenario for two customers interacting with the van hire site. The narrative structure is indicated by a thick double line snaking from the bottom to the top, running underneath and around table cells (the narrative could run from top to bottom over a few pages, or curved arrows could replace table cell border coding — UEFs use whatever is to hand and suits the documentation context).

Figure 2 shows how the internal dynamics of a UX element can be expressed as a narrative thread of beliefs, feelings, actions and reactions. In the example, positive emotional responses and a growing confidence result in a UX that ends with feeling well prepared to pick up a van and use it to collect a purchase. The closing feeling and belief cover most of a *value proposition* that the site helps you book *the right van for the right time from the best depot at a good price*.

UEFs thus express project teams' understanding of how human motivations and abilities combine with design elements to produce a meaningful experience that brings benefits and costs as worthwhile or adverse outcomes. UEFs thus express *achievable worth* for specific stakeholders. Headers and footers can be used to highlight resulting outcomes, as well as the relevant features and qualities that support the UX. Any worthwhile outcome so indicated must also be linked from the UX in associated

worth maps. Alternative multi-column formats are also possible for UEFs.

There can be several UEFs for each UX element in a worth map, each representing one or more abstract scenarios for one or more stakeholders.

6.4 Some Other WCD Approaches

UEFs are sufficiently expressive to support scenario and stakeholder based analyses in further WCD approaches. For example, *credibility* analysis can be supported by Worth Delivery Scenarios (WoDSs). These can start with the narrative paths through UEFs, expand them into textual scenarios and assess the credibility of each link in the narrative. WoDSs must have happy endings corresponding to worthwhile outcomes.

Credibility of outcomes depends on credibility of means-end chains. There are no grounds in Figure 2 for the belief that a van had been booked for the *right time period*. This is because some rows have been deliberately deleted! Inspection can expose the resulting insufficient grounds for forming the belief 'Booked right van for right time period'. Missing rows must be reinserted to improve credibility. Once a UEF is complete enough to make abstract scenarios credible, they can be further challenged through authoring more detailed textual environment scenarios.

UEFs can be also assessed for stakeholder specific *balances of worth*. UEF headers or footers can indicate worthwhile or adverse outcomes. Hedonic qualities in feelings columns can also be considered as part of a balance of worth. Since even abstract scenarios must be stakeholder specific, it follows that the overall balance of worthwhile and adverse outcomes and feelings can be regarded as a detailed instan-

tiation for the *inclusiveness* meta-principle. Headers or footers can indicate the stakeholder(s) to whom a UEF applies, and can be further marked with a graphical indication (e.g., a green to red scale from positive to negative worth balance). These indicators can be copied to the UX elements in worth maps, allowing overall *inclusiveness* to be assessed relative to a range of likely stakeholder outcomes. Unacceptable likely outcomes can be addressed in iterative activities of *worth balancing*.

Other WCD approaches include *Worth Webs*, a Venn diagramming approach that places stakeholders in overlapping contexts of individual and collective worth. They address individual worth through Alderfer's (1972) motivational categories of Existence, Relatedness and Growth (ERG). Collective worth is addressed through worth spheres for social categories of institutions, kin, and kind (IKK). Relatedness links individual and collective worth, as do *Locales*, which are spatial processes that create social *places*. Worth webs are thus use this L-ERG-IKK framework that interrelates place, social structure and individual needs and wants. This simplifies an earlier approach to individual and collective worth (MILKK, Cockton 2006).

Worth webs support worth mapping by identifying the considerations (or *sensitivities*, Cockton 2008c) that provide creative bases for sketching worth map elements prior to adding associations and refining worth maps. In terms of the artillery metaphor, considerations or sensitivities support both *loading* (of design elements) and *aiming* (at human elements). Hence we can load while aiming, although the WCD framework lets us load first. However, unlike UCD it does not insist on aiming first. We can load first as with technology probes (Hutchinson *et al.* 2003). We can never aim first. Even the most human-centred *destinies* worth maps (Cockton 2008a)

still have some technologies in mind when mapping out key worthwhile and adverse outcomes.

6.5 HCI Approaches and WCD

Many existing HCI approaches can be used in WCD, perhaps with some modification. Scenarios have already been mentioned in their modified WoDS form, as have interaction analysis transcripts in their envisionment form of UEFs. Similarly, a wide range of HCI specification and sketching approaches can be used without modification to express design elements. We can also use existing field research approaches (Randall et al. 2007), including indirect methods such as cultural probes (Boehner et al, 2007), be used to maximise *receptiveness* to potential design and human elements. Considerations and sensitivities cannot be wholly derived from worth webs. Thus although sets of personas (Pruitt and Adlin 2007) can readily be derived from worth webs, these too are best grounded in appropriate field research.

6.6 Other Approaches and WCD

Human Science approaches such as motivational and social theory underpin the L-ERG-IKK framework. Receptiveness can further benefit from choice theory, affective psychology and theories of experience, amongst others. Similarly, business approaches such as value propositions and HVMS have been adapted for WCD. Receptiveness can benefit from use of trends data and approaches from consumer psychology.

WCD requires a wide range of approaches. While usability largely relied on cognitive psychology, and much UX relies on affective psychology, WCD cannot be restricted to one disciplinary subfield. To understand worth, and to be receptive to its implications for stakeholder research, interaction design and

holistic evaluation, HCI must become much more eclectic.

7.0 Conclusions

HCI must move beyond a UX focus on emotion and activity to a focus on worthwhile outcomes. UX and usability remain important, but they have a place and can be kept in it, much to their benefit! This place is provided by the common purpose begins with a focus on *intended* worth and then progresses onto *achievable* and lastly *achieved* worth. This strategic approach puts UX and usability where they can be more effective. Within WCD, UX and usability reduce costs and increase some benefits, but what matters is how they contribute to, or obstruct, achievement of the intended worth that provides purpose for design projects. UX and usability are not absolutes. They can only be means to ends, and not ends in themselves,

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