

Design with Intent Architectural Lens

The Architectural Lens draws on techniques used to influence user behaviour in architecture, urban planning, traffic management and crime prevention through environmental design (see also the Security Lens).

While most techniques have been developed in the built environment, many can also be applied in interaction and product design, even in software or services; they are effectively about using the structure of systems to influence behaviour, while some of the patterns, such as Simplicity, Feature deletion and Hiding things are really fundamental to design itself.

Angles

Can you slant or angle things so some actions are easier than others?

Some cigarette bins are sold to authorities using the sloping top as a feature, discouraging people leaving litter on top



Converging & diverging

Can you channel people so they come together (or split up)?

Gates (and gatehouses) channel visitors through a narrow opening, allowing a toll to be levied, or to help control potential threats



Conveyor belts

Can you bring a feature to the users, or move the users to where you want them to be?

Moving walkways in airports help travellers move more quickly, but also prevent people blocking corridors, especially in groups



Feature deletion

What would happen if you simply took away features you don't want people to use?

Various politicians have proposed simply removing standby buttons from consumer electronic products, to reduce energy use



Hiding things

Can you hide functions or elements you'd prefer people didn't use?

These church hall heating controls have been hidden (leaving only the timer accessible) to reduce errors by users unfamiliar with them



Material properties

Can you use the properties of different materials to make some actions more comfortable than others?

Rough-textured paving can act as a subtle barrier between cycle and pedestrian tracks: stray over the line on a bike and you'll feel it



Mazes

Can get people to follow the path you want them to, on the way to reaching something they want?

Some store layouts route or channel shoppers past 'impulse purchase' items—often snacks—on their way to the checkouts



Pave the cowpaths

Can you recognise the 'desire paths' of some of your users, and then codify them into your system, so others follow too?

In Tigard, OR, residents marked informal 'neighbourhood trails' they used on a map, so the city could prioritise ones to 'formalise'



Positioning

Can you rearrange things so people interact with them in the locations you want them to?

Positioning pedestrian crossing push-button units on the right-hand side (UK) makes it more likely that users turn to notice oncoming traffic



Roadblock

Can you put things in users' way, so they take an alternative route, or adjust their speed?

'Chicanes' can slow down drivers, pedestrians and cyclists; the crossing chicane prevents running or cycling straight across the road



Segmentation & spacing

Can you divide your system up into parts, so people only use one bit at a time?

These individual seats replace a bench on the Paris Métro—spaced so that someone cannot lie down or occupy more than one



Simplicity

How simply can you structure things, to make it easier for users to do what you'd like them to do?

EcoButton allows a user to put a computer into a low-power state with just one press, making it much easier for users to save energy.



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Design with Intent Errorproofing Lens

The Errorproofing Lens treats deviations from the 'target behaviour' as 'errors' which design can help avoid, either by making it easier for users to work without making errors, or by making errors impossible in the first place. It's often found in ergonomics, health & safety-related design, medical device design and manufacturing engineering (as poka-yoke): where, as far as possible, one really doesn't want errors to occur at all.

A key difference between errorproofing and some other views of influencing behaviour is that errorproofing doesn't care whether or not the user's attitude changes, as long as the target behaviour is met. Attitude change might be an effect of the errorproofing, but it is not required.

Are you sure?

Can you design an extra 'confirmation' step before an action can be performed?



Some British Rail train doors require passengers to lower the window to get access to the handle, mounted on the outside

Choice editing

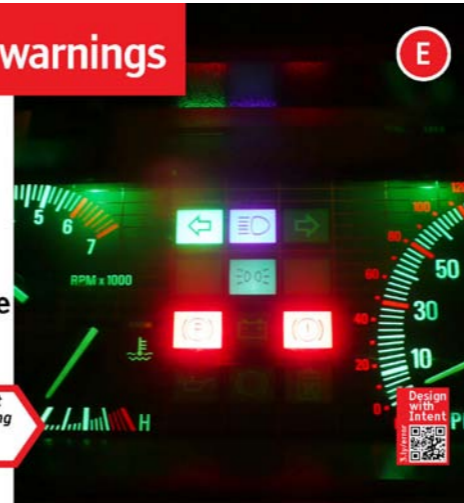
Can you edit the choices presented to users so only the ones you want them to have are available?



Choice editing can be driven by legislation, e.g. leaded 4-star petrol being phased out in the EU by 2000 (when this photo was taken)

Conditional warnings

Can you give users warnings based on detecting the error they've made, or might be about to make?



The parking brake warning light on a car's dashboard is a warning to the driver: don't drive off without releasing the brake!

Defaults

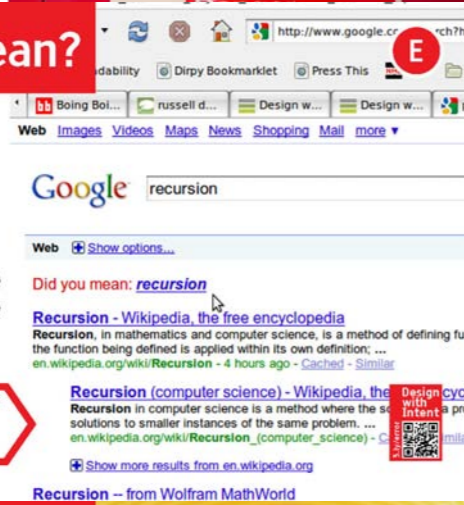
Can you make the default setting the behaviour you'd prefer users to perform?



In this software 'nag' screen, the default button (pressed if the user just hits 'enter') is information on licensing rather than 'I agree'

Did you mean?

Can you detect and suggest a better option to users when it looks like they're making an error?



Google's suggestion algorithm is continually evolving to take account of search trends; it also includes this nice 'easter egg'

Interlock

Can you set things up so one action can't be performed until another is completed?



Most modern cash machines don't dispense cash until you remove your card, making it less likely you'll leave it behind

Matched affordances

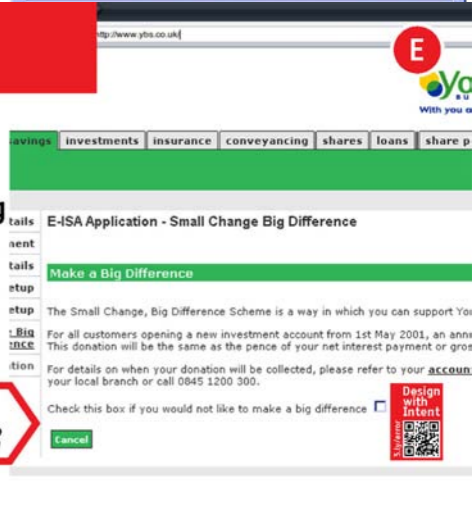
Can you make parts fit only when the right way round, or only with the products they should do?



The bevelled corner on SIM cards, memory cards and floppy disks ensures that they can't be inserted the wrong way round

Opt-outs

What happens if you make an option something people opt out of, rather than opt in to?



This building society asks new savers if they want to opt out of donating part of their interest to charity - by default it is donated

Portions

Can you change the size of the portions or the units of 'stuff' you give users?



'Portion packs' for snacks give customers the 'right' amount of food to eat in one go (sometimes a particular amount of calories)

Task lock-in/out

Can you keep a task going that needs to be, or prevent one being started inadvertently?



To prevent accidentally engaging reverse gear, most gearboxes include a 'gate' over/under which the stick must be lifted or pressed

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Design with Intent Interaction Lens

All the patterns are really about interaction design in one form or another, but the Interaction Lens brings together some of the most common design elements of interfaces where users' interactions with the system affect how their behaviour is influenced. So there are some core Human- Computer Interaction patterns here, such as kinds of feedback, progress bars, and previews, and some currently less-used such as feedforward.

This lens also includes patterns from the growing field of Persuasive Technology, where computers and phones influence behaviour through contextual information and guidance. Among these are kairos, tailoring and tunnelling, identified in BJ Fogg's seminal book *Persuasive Technology: Using Computers to Change What We Think and Do*.

Feedback through form

Can you use the form of your object itself as a kind of interface, giving feedback or suggestive cues?



Royal VKB's 100g/250g Balancing Bowls are weighted so they tilt noticeably and audibly when the 'portion size' is reached when filling



Kairos

Can you give users a suggestion at exactly the right moment for them to change their behaviour?



Automatic warning signs can alert drivers to upcoming dangers at the right point for them to respond and slow down accordingly



Partial completion

Can you show that the first stage of a process has been completed already, to give users confidence to do the next?



Pre-filled details such as delivery addresses can be an effective way of speeding up an order process and reducing 'shopping cart abandonment'



Peer feedback

Can you give users feedback on their behaviour from other users of the system, equal in status to themselves?



Peer feedback on comments and stories is central to sites such as Slashdot ('karma' scores) and Digg ('digging' and 'burying')



Progress bar

Can you let users know their progress towards achieving a goal?



As demonstrated by examples from LinkedIn and Wikipedia, progress bars showing 'nearly complete' can make a goal seem more achievable



Real-time feedback

Can you let users know how what they're doing is affecting the system?



Energy meters can allow householders to see which appliances use the most electricity, and how much this is costing



Simulation & feedforward

Can you give users a preview or simulation of the results of different actions or choices?



Interactive savings / loan simulators such as this from Yahoo! are increasingly common, and can influence customer decisions



Summary feedback

Can you give users a report on what they've been doing, or its effects?



GreenPrint, software that reduces wasted prints through better usability, provides users (and their bosses!) with a summary of resources saved



Tailoring

Could your system adapt what it offers to match individual users' needs and abilities?



The Pam personal activity monitor suggests exercise regimes tailored to the user—something approaching the role of a 'personal trainer'



Tunnelling & wizards

Can you offer users a wizard to 'tunnel' them through a decision process in the way you'd like?



This installation wizard tries to get users to 'choose' to install additional (and irrelevant) software by presenting them as default parts of the process



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Design with Intent Ludic Lens

Games are great at engaging people for long periods of time, getting them involved, and influencing people's behaviour through their very design. Yet this potential has (so far) been underexplored in application to other kinds of situations outside 'recreation'.

The Ludic Lens includes a number of techniques for influencing user behaviour that can be derived from games and other 'playful' interactions, ranging from basic social psychology mechanisms such as goal-setting via challenges & targets, to operant conditioning via unpredictable reinforcement and rewards, to common game elements such as scores, levels and collections.

Challenges & targets

What happens if you set people a challenge, or give them a target to reach through what they're doing?

Whoever laid out this coffee tub as a target for throwing coins knew a lot about influencing people to donate generously and enjoy it



Collections

What happens if you encourage users to collect a set of things (friends, activities, places, objects, etc) through using your system?

UbiFit Garden encourages users to maintain a regular variety of exercise activities, in order to 'collect' different types of flower



Leave gaps to fill

Can you leave deliberate gaps (in a design, message, etc) which users will want to fill, becoming engaged in the process?

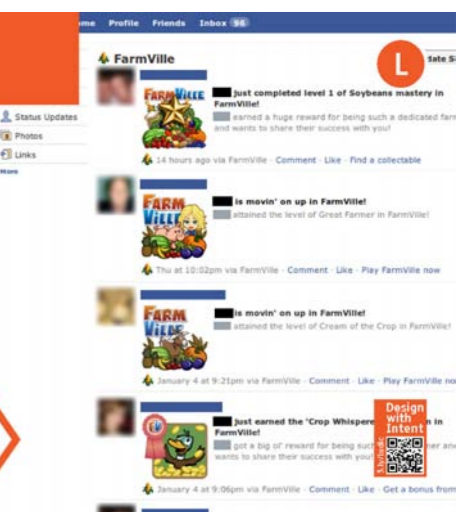
Deliberate use of red links on Wikipedia, signifying articles which should be written, "encourage[s] new contributors in useful directions"



Levels

Can you split your system up into achievable levels which help users feel like they're making progress?

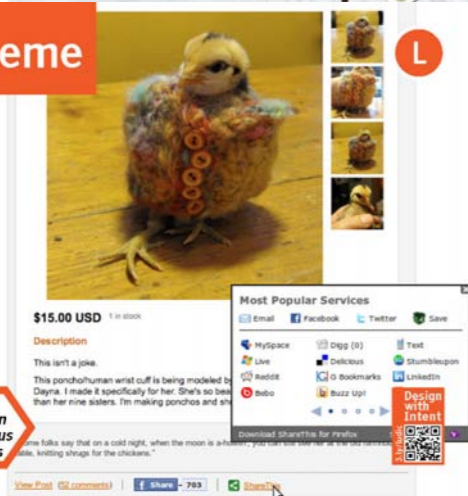
Easy-to-reach levels lower the barriers to participation and encourage continued engagement for games such as FarmVille



Make it a meme

What happens if you plan your design to be something people want to spread, and make it easy for them to do so?

ShareThis and similar quick-access social sharing services can mean rapid 'viral' or 'meme' status for interesting or amusing stories



Playfulness

Can you design something which 'plays' with its users, provoking curiosity or making interactions into a game?

Spiral wishing wells turn giving money to charity into something actively fun for donors, and provoke curiosity of passers-by



Rewards

Can you encourage users to take up or continue a behaviour by rewarding it, through the design of the system?

Kai's Power Tools (pioneering visual effects software) revealed 'bonus functions' to reward users who developed their skill level



Role-playing

What happens if your system gives users particular roles to play, or makes them feel like they're playing a role?

Tim Holley's Tio encourages children to become 'energy champions' for their household, influencing parental behaviour



Scores

Can you give users feedback on their actions as a score or rating allowing comparison to a reference point?

The 'Brain Age' score given by Dr Kawashima's games for Nintendo gives users a clear incentive to keep using the software



Storytelling

Can you tell a story via your design, which interests users and keeps them engaged?

Dyson uses narrative booklets drawing customers (and potential customers) into the story behind the company and its technology



Unpredictable reinforcement

What happens if you give rewards or feedback on an unpredictable schedule, so users keep playing or interacting?

Arcade games such as this coin pusher usually employ a strong element of unpredictable reinforcement, to keep users playing/paying



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Design with Intent Perceptual Lens

The Perceptual Lens combines ideas from product semantics, semiotics, ecological psychology and Gestalt psychology addressing how users perceive patterns and meanings as they interact with the systems around them, and puts them into forms which invite the designer to think about how they might influence people's behaviour. Most are predominantly visual, but they need not be: sounds, smells, textures and so on can all be used, individually or in combination. These techniques may often applied by graphic and interaction designers in the course of a job or project without necessarily considering explicitly the influence they can have on users' perceptions and behaviour.

(A)symmetry

Can you use symmetry to make elements look related, or asymmetry to show difference and focus attention?

The symmetrical holes on this lifebuoy, even without the text, suggest that it should be gripped with both hands simultaneously

Colour associations

Can you use colour to suggest associations between particular behaviours and outcomes?

This racecourse bookmaker's keyboard has a detailed language of colour-coded groups of functions, to aid rapid action-taking

Contrast

Can you create an obvious contrast between parts of your design or the context in which it's used?

In 2004, Britain's Royal Mail switched to using red rubber bands for bundling post, to make them easier to spot if dropped accidentally

Fake affordances

Is there anything to be gained from making something look like it works one way, while actually doing something else (or nothing at all)?

Many elevator/lift 'door close' buttons are repeatedly 'placebo buttons', giving an illusion of control but not speeding up the process

Implied sequences

Can you make it look like there's a sequence for users to follow, through the layout of elements?

This East German rail ticket machine makes very clear the order in which the interface should be used, with a sequential layout

Metaphors

Can you employ a metaphor / analogy of something familiar, so people understand or use your system the same way?

Tipjar.com, launched in the late 1990s, was one of the first simple micropayment systems, using the familiar metaphor of a tip jar

Mimicry & mirroring

Can your system mirror or mimic a user's behaviour or mood in some way, to increase the engagement a user feels?

Chatbots have evolved beyond the classic ELIZA, and are being used in social engineering attacks to extract information and deliver malware

Mood

Can you use colour, images or other sensory stimuli to set a particular mood for a user's interaction with your system?

Changes in hue, saturation and brightness can set moods: which room would you choose to stay in? (assuming the bed was made!)

Nakedness

Can you remove cues that people take for granted, to get them to think more about what they're doing?

'Naked roads' with signage and markings removed can encourage pedestrians, cyclists and drivers to be more aware of each other's presence

Perceived affordances

Can you design the form of your system to suggest particular actions (or constraints on action) to users?

Reshaping the holes on bins to match the 'form' of different types of waste has been shown to increase recycling levels significantly

Possibility trees

Can you give people a 'map' of the routes or choices they can use to achieve different goals?

Presenting a simplified set of possibilities, transport maps can influence users' perceptions of geography, and promote certain routes over others

Prominence

Can you direct your users' attention to what you want, by making it more prominent, obvious or exaggerated?

The 'big red button' is a common way of making a control prominent. Here on London's DLR, it is needed to help avoid accidental presses

Proximity & grouping

Can you group elements so that users perceive they have similar functions or should be used together?

This power supply has controls often used in pairs (coarse & fine voltage adjustment, and output terminals) explicitly grouped

Seductive atmospherics

Can you use ambient sensory effects (sound, light, smell, etc) to encourage users to interact or behave in the way you'd like?

The distinctive 'Subway smell' may only be a by-product of baking, but intentional 'scent branding' is increasingly common in retail design

Similarity

Can you make elements look similar so users perceive them to share characteristics, or that they should be used together?

Paid-for links on Microsoft's Bing look very similar to the real search results, to increase the chance of users clicking them

Transparency

Can you (perhaps selectively) reveal what's going on under the surface, to influence users' perceptions and behaviour?

Dyson's transparent dust container both demonstrates the vacuum cleaner's effectiveness, and makes it likely to be emptied more often

Watermarking

Can you make a user feel like he or she (or someone else) 'owns' or has responsibility for something?

One UK shopkeeper writes customers' names on the packaging of snacks they buy, discouraging littering through 'taking ownership'

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Design with Intent Cognitive Lens

The Cognitive Lens draws on research in behavioural economics and cognitive psychology looking at how people make decisions, and how this is affected by 'heuristics' and 'biases'. If designers understand how users make interaction decisions, that knowledge can be used to influence interaction behaviour. Equally, where users often make poor decisions, design can help counter this, although this may lead to a 'we know what's best for you' attitude. Dozens of cognitive biases and heuristics have been identified which could potentially be applied to design. The patterns detailed in these cards are some of the most commonly used; this selection draws particularly heavily on the work of Robert Cialdini, Dan Ariely, Richard Thaler and Cass Sunstein.

Assuaging guilt

Can you influence users by helping them reduce feelings of guilt about their behaviour?

This message both implies that one should feel bad about the ethics of coffee production, and offers an easy way to take away the guilt



Commitment & consistency

Can you get users to commit to an idea or goal, so they feel they should behave consistently with this commitment?

In a 1976 study, householders sent a 'we are saving oil' sticker subsequently used 10% less heating oil than groups not sent the sticker



Decoys

Can you add 'decoy' choices, making the others (which you want people to pick) look better in comparison?

Would you choose the \$79.88 option here, when the other two offer you a free gift AND save you slightly more money?



Desire for order

Can you use people's desire for tidiness to influence them to rearrange elements or take actions you want them to?

The AWARE Puzzle Switch, a light switch design by Lieve Brons and Karin Ehrnberger, is visibly 'disordered' when in the 'on' position



Do as you're told

Can you use an authority figure or authoritative instruction to tell users what they should (or should not) do?

Impenetrable 'agreements' such as this often make heavy use of authority (and threats) to reinforce their message: do as you're told



Emotional engagement

Can you design your system to engage people's emotions, or make them emotionally connected to their behaviour?

The open beak of these 'baby bird' litter bins at a city farm (visited by lots of children) suggests that they are hungry and would like to be fed



Expert choice

Is it possible to show users the choices that an expert or authority figure would make when in the same situation they're in?

Endorsements where the celebrity is an 'expert' (such as chef Heston Blumenthal in this Waitrose campaign) can lend credibility



Framing

Can you selectively present choices in a way which frames the range available in a more positive light?

Starbucks' drink sizes start with 'tall', framing the range further up the scale and avoiding any mediocre implications of 'small' or 'medium'



Habits

Can you make it easy for a new behaviour to become habitual, by building it into an existing routine?

Simply choosing to take the stairs rather than the lift / elevator can quickly become part of a daily routine at home or work



Personality

Can you give your system a personality or character that engages users, becoming a 'social actor'?

Dutch researchers have used Philips' 'Kat' robot to influence users' decision-making with washing machines, advising and expressing opinions



Provoke empathy

Can you help users see other people's perspectives and thought processes, by revealing them through the design of your system?

Twitter, Facebook et al allow us to see at any moment the problems and concerns of millions of others just like us (or not) all over the world



Reciprocation

Can you make users feel they've been done a favour (by the system, or by other users) and want to return it?

This busker's postcards may be 'free', but the social norms of reciprocation mean most people will give him some tip in return



Rephrasing & renaming

Can you rephrase or rename what you'd like users to do, so it aligns better with what they already want to do?

Twitter changed the name of the 'Devices' tab to the more easily understandable 'Mobile' to encourage more users to set up their phones



Scarcity

Can you emphasise that a resource is valuable, limited in quantity, or running out (or actually limit it artificially)?

We're used to retailers emphasising that 'everything must go' and then not actually closing; in this case, however, the shop did close down



Social proof

Can you show people what other users like them are doing in this situation, and which choices are most popular?

Amazon's recommendations can be helpful to buyers by expanding the scope of their knowledge, while increasing sales for Amazon



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Design with Intent Machiavellian Lens

The Machiavellian Lens comprises design patterns which, while diverse, all embody an 'end justifies the means' approach of the kind associated with Niccolò Machiavelli. These will often be considered unethical, but nevertheless are commonly used to control and influence consumers through pricing structures, planned obsolescence, lock-ins and so on, and are central to work by authors such as Vance Packard and Douglas Rushkoff, revealing the 'hidden' structures which shape our everyday behaviour. In technology contexts, Benjamin Mako Hill and Chris Nodder have both done great work exploring this area. Elements of game theory are present in some of the patterns, and this is worth further investigation.

Anchoring

Can you affect users' expectations or assumptions by controlling the reference points they have?

Restaurant menus may use 'anchor' items: prominently placed, higher-priced dishes, raising what customers expect to be paying

Antifeatures & crippleware

Can you deliberately disable some functions even though they're still present, to drive users to upgrade, or to allow price discrimination?

Sony's cheaper 60-minute MiniDiscs were identical to the 74-minute ones except for a pre-written portion of code preventing full use of the space

Bundling

Can you include something you want users to do, along with something they want to do, so both get done?

Crushing up pills or tablets in a spoonful of peanut butter can be a good way to get dogs to take medicines they would otherwise refuse

Degrading performance

Can you degrade the performance of a product or system until users comply with some behaviour change you want?

Some Nokia phones allegedly sense when a 3rd-party battery is used and switch into a high-power mode so it runs out more quickly

First one free

Can you give something away which gets people interested or addicted, so they come back and pay for more?

Offering one chapter (often the introduction) free has become increasingly common as a way of promoting new books more widely

Forced dichotomy

Can you configure a system so there is no 'middle ground' possible, and users must make a choice one way or the other?

An even-numbered (e.g. four-point) rating scale does not allow a 'middle' value: it forces respondents into making a 'good or bad?' choice

Format lock-in/out

Can you design your system so users become committed to a particular format or way of doing things?

Panasonic cameras include a battery authentication system, which prevents using cheaper non-Panasonic replacements

Functional obsolescence

Can you design things to become technologically superseded (or even wear out) quickly, so people replace them?

While new models do bring real technological advances, Apple has managed to create an 'upgrade treadmill' for iPhone buyers

I cut, you choose

Can you structure a system so that no one user can get an advantage over others simply by being first to act?

If person 1 cuts a cake into halves, and person 2 chooses the half he or she wants, there is no advantage in person 1 cutting the cake unfairly

Poison pill

Can you arrange things so that an otherwise attractive option has an unpleasant, self-defeating deterrent side-effect?

Security ink tags release indelible ink if removed incorrectly, in an attempt to make it simply not worth stealing the clothes

Serving suggestion

Can you direct users to use a product or system in a particular way through examples or demonstrations?

Alka-Seltzer reputedly introduced the 'two tablets per dose' direction to users as part of a 1960s TV ad; before that, only one was taken

Slow / no response

Can you get users to try different actions or repeat a behaviour by making the system respond or give feedback slowly?

Duplicate orders can be a problem where web forms are slow to submit and users click multiple times: this kind of instruction is common

Style obsolescence

Can you design things to become unfashionable or undesirable quickly, to spur the desire for replacement or upgrades?

Fashions and trends are obvious in high-street retailing, but are also prevalent (and can be deliberately created) in other fields

Worry resolution

Can you help users overcome worry about their behaviour (perhaps after having suggested it in the first place)?

The term 'halitosis' was allegedly introduced in a 1921 Listerine ad, part of a series making people worried about bad breath, then offering a solution

Design with Intent Security Lens

The Security Lens represents a 'security' worldview, i.e. that undesired user behaviour is something to deter and/or prevent through 'countermeasures' designed into products, systems and environments, both physically and online, with examples such as digital rights management.

From a designer's point of view, this can often be an 'unfriendly' – and in some circumstances unethical – view to take, effectively treating users as 'guilty until proven innocent'. However, taking inspiration from the the patterns, it's possible to think of ways that they could be applied to help users control their own habits or behaviour for their own benefit – encouraging exercise, reducing energy use, and so on.

Coercive atmospherics

Can you use ambient sensory effects (sound, light, smell, etc) to make it harder for users to behave in certain ways?

Blue lighting is used in some public toilets (e.g. here, in Edinburgh) to discourage drug injection by making veins difficult to see

Peerveillance

What happens if users know (or believe) that what they're doing is visible to their peers also using the system?

Neighbourhood Watch schemes are signed so that they provide a deterrent effect—"people here are vigilant about what's going on"

Sousveillance

Can you give people 'lower down' a hierarchy the ability to observe and monitor the behaviour of people above them?

TheyWorkForYou allows the public to monitor politicians' activities easily: transparency leading to better accountability

Surveillance

What happens if users know (or believe) their behaviour is visible to or monitored by people in positions of power / authority?

CCTV is often presented as a crime deterrent, influencing public behaviour, whether or not it is switched on or actually monitored

Threat of injury

What happens if your design threatens to (or actually does) harm users who behave in the 'wrong' way?

Spikes on walls—such as these stick-on plastic ones—can act as a deterrent to climbing or sitting, with varying effectiveness

Threat to property

What happens if your design threatens to damage users' property if they use it the 'wrong' way?

Traffic control spikes are an attempt to enforce one-way traffic at entrances to car parks (etc): the threat is made very clear

What you can do

Can you give users different choices or access to functions depending on the capabilities they can demonstrate?

Child-proof lids are often used on containers for dangerous substances, such as medicines and garden and cleaning products

What you have

Can you give users options or access to different functions depending on their possession of a special tool, key, device or token?

Access cards allow the issuer to restrict entrance to certain buildings or areas to whoever has a card with the right permissions

What you know

Can you test what users know (information, passwords, etc) to give them access to different functions?

Remembering usernames, passwords and answers to security questions is increasingly part of our everyday lives, on- and offline

What you've done

Can you change the options available to users based on their current or previous behaviour?

Teaching machine textbooks allow students to progress in different orders depending on which concepts need more explanation

Where you are

Can you make different choices available to users depending on their location?

Some supermarket trolleys have devices fitted to lock the wheels when taken outside a defined area, usually an adjacent car park

Who or what you are

Can you use criteria innate to particular individuals, groups or objects to block or make different options available?

Artificial height restrictors attempt to allow only certain types of vehicles into a car park, by discriminating on vehicle height