# Limiting experience and cognition by flexibility, Interaction design and cybernetics

Tore Gulden[1] and Frederick Steieer[2]

[1] Oslo Metropolitan University, Oslo, Norway
[2]University of South Florida, Tampa, USA
lncs@springer.com

**Abstract.** In this paper, we discuss how flexibility in interaction design processes may lead to hinder flexibility in user praxis and thus cognition, experience, and behaviour, and for design praxis circuits and functioning, and the meta cognition about the design praxis in relation to meaning, aim, change, and inquiring dimensions of functioning, such as the purpose interaction design serve up against the cause by which they arise. A theoretical discussion of the widespread agile and lean interaction design processes in relation to cybernetic theory and the term flexibility introduced by Bateson is the basis for the discussion.

**Keywords:** flexibility, cybernetics, interaction design

## 1 Flexibility of flexibility

Interaction design is typically created with the intention of guiding users through a web page or application architecture by semantic explanations or nudging. Interaction design has left the waterfall processes and implemented agile communication techniques among others, to become more flexible and perhaps holistic while developing design solutions. This flexibility within an organization theory understanding, has led to a "more openness to change and a willingness to do things differently as opposed to the rigid" [1] formal linear-based design approaches. The flexibility thus has led to design and coding teams that can complete designs with less loops of major recoding and redesigning. This flexibility however has possibly shunned away three other layers of flexibility that has a great potential of development, namely the missing flexibility of rethinking and restructuring own development processes within the existing design paradigm, rethinking the paradigm that the design process functions, and the missing flexibility of experiencing while using or exploring interaction designs for users.

This paper has as a starting point, then, the recognition that all forms of design process, including interaction design, need seek to create a balance between structure and flexibility. Yet, rather than seeing this what this balance might look like as one that can be generalized across situations, we recognize the need for the structure/flexibility balance to fit with the context, or situation. As such, we propose that interaction design must concern itself with a flexibility of flexibility. To develop this idea, we turn to

This is a post-peer-review, pre-copyedit version of a conference proceeding published in HCII 2020: HCI International 2020 – Late Breaking Posters, 22nd International Conference, Proceedings, Part I, which is part of the Communications in Computer and Information Science book series (volume 1293). The final authenticated version is available online at: https://doi.org/10.1007/978-3-030-60700-5_4

cybernetics, where concepts of flexibility, in conjunction with adaptation and variety, are central.

### 1.1 Cybernetics

Cybernetics is about the understanding systems and "flexibility must be understood as a property of a system" [2]. A cybernetic understanding of flexibility explains how it serves as a potential of adaptive behaviour and change. Bateson defined flexibility as "uncommitted potential for change" [3]. Flexibility however, has another end to its functioning, by that it is tied to limited flexibility [1]. "To be flexible, a system must retain (or even increase) its variety of potential responses. Yet at the same time, as Bateson noted, increasing variety in one domain can lead to decreasing variety, as a compensation, in another related domain. In short, there is an economics of flexibility" Within this economics of flexibility, we need consider fully what are the consequences of related increased and decreased flexibilities [See 3 In: Steier, 2005].

## 2 The making and use of interaction design can be understood as circularity

The praxis of behaviour by the designer is similar as for the users. The design process describes the circuits, and the behaviour the emotions [4]. Thus one could feel being in a very flexible situation and yet be bound. Such binding is not so easy to recognize when named the opposite. For the designer and the design agency, the process is often flexible within a limited defined system functioning and goal. If a design member initiates a different way of designing in a design team, the existing design system would hinder it because the flexibility of the existing system is based on a clear goal, often related to cooperation, time, and functioning. The flexibility of the system thus, does not allow changes outside the defined area of flexibility.

### 2.1 Flexibility of flexibility for the users

When an interaction design is flexible in use it may facilitate for users to explore intended functions through multiple media, suggested similar functions and so forth. A cybernetic analysis of this flexibility involves the study of what it does not offer, or hinder users to explore or do. In order to exemplify we can look to a general online newspaper that offers a flexibility by offering of popular or connected articles, but does not suggest unpopular or less read articles, nor critical articles in other news channels for example. In extension, this flexibility function of informing about similar articles, articles that involves the same person, or other articles that readers like, disturbs the concentration of reading the initial article and narrows the area explored by the reader.

Hence, analysing such a flexibility layout through a cybernetic perspective, one can say that the news service in this example, serves to hinder concentration and limit news exploration by flexibility [2] for the reader.

When an internal flexibility within the mentioned example of the newspaper article leads the user to orient the readers attention to all articles connected to an article within the same news channel, the design serves to hinder other behaviours, alternative news channels and other emotions. The flexibility instigates the continuance of use within the same sphere, possibly due to will to influence and marketing functions. Every new turn taken by the user, in an interaction design may not lead to different horizons of experience or understanding, rather they often loop (circulate) back to nodes within the internal network, and leads to a minimal learning referred to as zero learning in cybernetics [3]. A cybernetic understanding of such circularity may contribute to how we can understand and perform interaction design as a changing experience offering other types of flexibility. Circularity in interaction design thus may be understood as explanations of actions within and because of the architecture design, typically referred to as navigation. What is left out of such an understanding of experiencing design then is that the user also acts within a circular relationship [5]. This cybernetic understanding of circularity which includes the understandings of "our explanations of our actions" …"integrated together with our acting in a circular relationship" [5] involves the second order (or level) of interpretation, researching, controlling, or understanding a first order systems functioning. Furthermore, such "circularity between understanding and action" may be" exemplified in the eponymous cybernetic example of steering a ship, where the steersman's understanding of the effects of his or her action informs how he or she continues to act. This contrasts with where we try to apply theory linearly to practice or, vice versa, where we fail to situate theory in such a way that it can lead to new ways of acting" [5] for both designers and users. If the context for the steersman in this example is changed to the steering or orienting within, or experiencing interaction design, the example suggest that for every choice made by a user, effects the next action and the direction of continuing act. This space of potential emergent unforeseen acting is seldom looked upon as a design potential other than the already mentioned function of directing to similar experiences or other places in the channel/platform architecture. Effects of actions or acting as a steersman at sea (taking a turn for example) represents an abundant variety of consequences (fun, explorative, dangerous and so forth) and experiences, and the choice for further change in praxis is up to the steersman, not the service. Hence, the service is limiting the experience in a circular fashion that can lead to reading to justify opinions and worldviews rather than exploring. Flexibility of flexibility for the users then is to be freed from the flexibility presented.

## 2.2 Flexibility of flexibility when designing

That is, when designers taught in a tradition that recognizes lean and agile processes as flexible, they believe it and thereby they miss out of an autonomous work process and a mind-set to seek other flexibilities that may occur in every new horizon that the turn

of the ship in new routs may present. Accordingly, limited flexibility facilitates work circuits that produce a context that enables zero learning by the binding to one understanding, rather than to seek alternative processes, situations, and functioning. The goal then within such a paradigm is to redesign design processes rather than challenging and altering the goals that led to the creation of them. Hence, the flexibility of the interaction design processes often lies within defined process, programs, goals, and content. This limited and teleological understanding of flexibility thus, which prevents thinking outside the box since the repeated behaviour circuits creates rigid habits.

### 2.3 Play as a dimension of understanding flexibility

In research on game mechanics, play functioning is often divided into progression and emergence structure for games [6]. Progression structures allows a space to behave, like in Super Mario, where you can do a whole lot but nothing that the creator of the game did not think of. In emergence structure games like football it is the rules that initiate behaviour and emotions, and new ways of doing emerge continuously. In that sense football represents flexibility of flexibility in that it affords behaviour that is created by the player [See for example: 7]. This emergent play context thus that stimulate new behaviour, such as a new offside strategy, represents higher level of learning, namely first order learning. That is, the history of doing is challenged and therefor also the experience. One often also see second order learning by the players, where the platform or paradigm of understanding the game is changed like for example rules change by cultural adjustment etc.

## 3 Flexibility of flexibility

For the interaction designer, the work environment can compare to a game structure. That is, they play according to rules often called agile communication, lean processes, and so forth and these rules compare to a progression structure platform. When recognizing the progression structure platform as flexibility, they rule out the possible first and second order learning potentials and in extension change and creation by emergence and thus they become inflexible. Accordingly, the possible worlds of variable understandings and experiences, flexibility of flexibility, offered by interaction design are often neglected or not recognized. Moreover, the experiences and cognition elicited while using the designs are limited to the history of the previous experiences in the design rather than the emergence of the future experiences and processes. We think education plays its role for this missed design potential identified. The emphasis on flexibility by agile processes has limited the space of flexibility for the users and cognition by the designers, possibly because interaction design education largely rely on flexibility as an autonomous work context.

Flexibility of flexibility thus needs to be implemented on different levels. In current praxis's the flexibility often lies within low impact system change like stock and flow of things, money, and resources, and structural change [8]. To achieve flexible flexibility however the system of work should also have opening for change of culture, systems, rules, and so forth [8]. This in for example processes of need-finding and context analysis that may lead to the acceptance of that a lot of things, behaviour, and processes are invisible to the interaction designers. Empathy processes for example will give different insights when opened up in order to discuss what to measure in order to what is quality of what function. It is for example reasonable to expect that interaction design has interactive functions and opens for the interacting in different ways for the user, other than simply cause and effect. Such interactivity however is seldom explored since the exploration of unknown unknowns represents an uncertainty beyond a common understanding of a flexible design process. That is, one miss out of the possibilities for the designer to explore real interactive systems in an interactive way- rather they are often limited by flexibility to merely testing of hypothesis. The user environments are controlling rather than open for processes of emergence or self-producing systems and flexible flexibility. Flexibility in education and in praxis thus is modelled on a progression structure rather than emergence structure.

An exploration of what types of learning and in extension design processes, experiences, an emergence structured design process can initiate or self-produce, would be an interesting continuation of this discussion.

## 4 References


1. Eriksen T. Mind the Gap: Flexibility, Epistemology and the Rhetoric of New Work. Cybernetics & Human Knowing. 2005;12(1-2):50-60.
2. Steier F. Exercising Frame Flexibility. Cybernetics & Human Knowing. 2005;12(f0020001):36-49.
3. Bateson G. Steps to an ecology of mind. Chicago: University of Chicago Press; 2000/1972.
4. Bunnell P. ASC: Dancing with Ambiguity. Cybernetics and Human Knowing. 2015;22(4):101-12.
5. Sweeting B. Cybernetics of practice. Kybernetes. 2015;44(8/9):1397-405.
6. Juul J. Half-Real: Video Games Between Real Rules and Fictional Worlds: MIT Press; 2011.
7. Gulden T. Engagement by lamination of autopoietic concentric interaction systems in games: A study of football and Pokémon GO Human Technology. 2018;14(1):96-134.
8. Meadows DH, Wright D. Thinking in systems : a primer. London: Earthscan; 2009.