Audiovisual Design: Introducing 'Media Affordances' as a Relevant Concept for the Development of a New Communication Model

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Abstract. Audiovisual Design is a communication model, represented by a methodology of analysis and development of content that mixes audiovisual elements with interaction software and digital interfaces. This essay introduces the concept of media affordances in Audiovisual Design as a contribution to understanding and planning of actions taken by a person during production and enjoyment of sound and video using the contemporary set of media. The model represents the intersection between Human-Computer Interaction Studies and Media Studies, required to develop audiovisual and sound content today. The present text introduces definitions of Audiovisual Design and outlines the concept of affordances, characteristics of mediatic tools required for an individual to perform an assigned role, or step from one to another. This involves processes of learning and assimilating available affordances in different contexts. Audiovisual producers must be able to understand and predict how Audience, in different levels of engagement or inertia, will react in face of tools available through content and interfaces of distribution.

Keywords: Audiovisual Design · Human-Computer Interaction
Media Studies · Affordances

1 Introduction

The communicational-methodological model of Audiovisual Design (AD) reunites methods and concepts from two traditionally isolated fields that share similar approaches: Human-Computer Interaction, from Computer Sciences, and Media Studies, from Communication Sciences. To give a brief description, AD shows two practical features: (1) To analyse audiovisual content produced with tools from both HCI and Media Studies altogether; (2) To predict user interactions and propose

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innovative applications of those tools in development of audiovisual creations. The model's main characteristic is the planning of interaction – or interactivity – simultaneously with creation and production of audio and/or video features, which occurs based upon four *Lines of Design* that configure and shape the creative process: Identity, Motivations, Experience and Content [1].

The integration of those elements (interactive tools and content) has altered the creation and production processes. The design and development of audiovisual content, including applications that make use of video, is swiftly changing in response to technological convergence. Individually, HCI and Media Studies do not contemplate changes in these two fields. The design of interactive computational systems initially focused on problem solving, tasks and functions; later, its reach was slowly broadened to incorporate other perspectives, such as novel possibilities, significances and emotions; and now people's behaviour is also contemplated. For instance, passive enjoyment gains relevance when the final object of the interactive system is an audiovisual content.

The same phenomenon is observable through the audiovisual consumption's perspective, once software usage has become as relevant as the quality of movies, TV series, online videos and sound content. All digital media for accessing content show a similar characteristic: interaction through software. The spectator's experience mixes an active posture (navigation and search for information) with moments of passive fruition (visualisation of content) in tasks such as accessing digital TV schedule guide, searching for a title in applications as Netflix, or recommending a video or audio content through social media. In other words, the simple act of choosing and watching a video programme may require the individual to assume different roles, with higher or lower levels of interaction and participation. Consequently, a revision of theories and methods supporting content development becomes necessary, especially in HCI field, in which the notion of 'users' has a limited part by not contemplating their total immersion in different media, especially audiovisual ones.

To adequately respond to this new scenario of audiovisual content production and fruition, in which audio, video and software are integrated in a single workpiece, AD defines four roles a person can assume: Audience, Synthesiser, Modifier, and Producer [1]. Uses of available resources afforded in each performed role vary in degrees of engagement and inertia.

The distinction of a set of actions – or interactions – made possible by various technologies in different moments of audiovisual consumption is a key element to understand alterations in level of actions related to storytelling or content – which, subsequently, may cause individuals to step from one role to another. In this essay, we are introducing the concept of *affordances* in the AD model. In short, the concept refers to potential uses an object may have and how such attributes allow users to carry out an action. For Norman [2], affordances must be conventional and consistent, a design principle emphasising the need for explicit cues that demonstrate to users what they can do with a device/system. Design must provide sufficient information/suggestions of 'what can be done' and how people should interact with the tool. Since users need

some motivation to act, without desire or drive to seek out possible uses they are likely to overlook them or simply fail in action.

AD considers that individuals, to alternate between roles, must understand the set of available actions (those the Producer expects they will undertake or avoid), as well as how they can subvert the medium to their own advantage or according to their own welfares. It is an essential concept in the convergence between theories and methods from HCI and Media Studies, where software becomes central to content enjoyment, whether through digital TV, internet or on-demand services of audio and video.

The article has the following structure: the AD model is presented in Sect. 2; Sect. 3 holds the conceptualization of affordance and its pertinence to media studies, while Sect. 4 presents elements regarding learning of affordances. Section 5 closes this essay by presenting some conclusions regarding application of model, and features that require further investigation.

2 The Audiovisual Design Communication Model

The communication processes can be defined using theoretical and conceptual models, describing communicative acts and the flow of information among people and present and acting communication technologies [3]. Recently, new models have been suggested, aiming to understand how the notion of individuality – and communities created around the generalisation of the concept – impact on media and on content creation. Jenkins et al. [4] proposed three simple models to describe different current communication scenarios: from one communicator to multiple recipients, Broadcast; online communication in which individuals have initiative of searching content, as Stickiness; and Spreadable, when content reaches an audience through actions of persons, mostly using digital tools. The authors describe the communication processes as connected to exchange of information and to various modes of media consumption.

However, Jenkins et al. [4] did not contemplate the technical-creative process of audiovisual production, where the subjectiveness of storytelling links to the objectiveness of interaction requirement. Interface problems, or bad user experiences, may compromise the entire audiovisual product. Some of those elements can be approached by technological learning and identification of possibilities of use of communication interfaces. In contrast, these matters are broadly studied by HCI. While audiovisual fruition has been hitherto considered a simple process with no requirements for technological mastery, software development rests upon the capability of use by individuals, that is, potentialities of action regarding the perception one holds towards an object or a technology when interacting with it [5].

In contemporaneity, increased presence of technology in different daily situations (mediatisation) profoundly transforms the media ecosystem. Besides the emergence of new technologies, complementarity between existing means is extended, and they combine themselves in different communication processes [6]. Such transformations have some impact in people's lives by bringing new possibilities of use and interaction, through the properties of each technology individually and convergences among those technologies. AD contributes to understand these arrangements, pointing that separate affordances of a technology applied in the production and distribution of content, as

well as competencies required to its use, are essential to the existence of multiple roles an individual (or person, or user) can assume.

2.1 Audiovisual Design

From the context outlined above, previous studies [1] identified the need of a theoretical and methodological model to integrate software development and audiovisual content creation. The Audiovisual Design results from the intersection of HCI and Media Studies. It is represented by a graphic workflow that allows recognition of the dynamic flow of audiovisual production considering a variety of scenarios and roles performed by individuals (Fig. 1) [1].

Although dominant in software development processes, 'user' is typically an abstract individual commonly identified by archetypes. Instead, in the AD model one person can perform different roles in different moments: Audience, Synthesiser, Modifier, and Producer.

Audience: this is the basis for all roles an individual can assume; it denotates low level or absence of interaction during media consumption. It is the passive behaviour associated to the Broadcast model, approaching digital interfaces through selection of channels, search and playing of content, subscription to a feed or channel, etc. Hence those people are identified in groups by audience ratings or data about access to a given content,

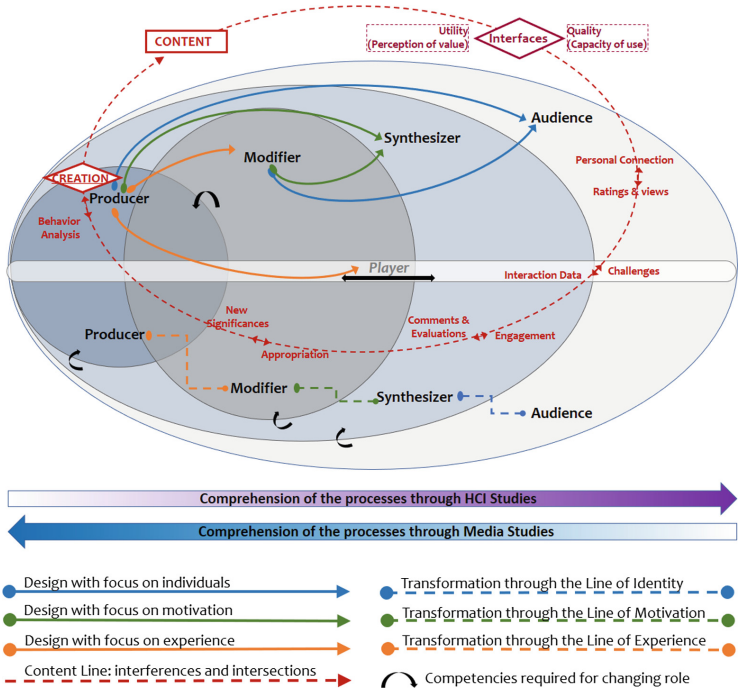

Fig. 1. Processual flow for Audiovisual Design (Color figure online)

enabling only a collective vision of their preferences. The relationship of individuals with content occurs in the level of personal taste and remains relatively private.

Synthesiser: the concept was brought in by Jenkins, Ford and Green from an idea developed by Bradley Horowitz [4]. These individuals present competencies to compile, classify, comment, recommend and share content they like, usually to construct a digital 'identity', a staged profile in a social network. Synthesiser's role considers the notion of engagement, the emotional link that allows people to express something about themselves using content to which they relate.

Modifier: this is the group of individuals that appropriate and transform content to express something about themselves. These super-engaged hardcore fans shall acquire competences to perform this role. There are a set of activities that determines if one belongs to this role: *remixing*, that is, appropriation of content to create something new, connected or not to the original idea; *improvement*, or modifying the original content to amend something one dislikes about it, altering the original meaning or result of a narrative; *participation*, when the person interacts with and transforms the show (live or recorded) while it is being produced, thus altering the output and becoming a temporary co-producer.

Producer: a person or group of people who creates original content (even if inspired by other media content); they can either be autonomous and independent or collaborators in great media corporations. Every Producer is a Synthesiser by nature because he or she holds competencies for content distribution, but the competencies of the Modifier only apply when industrially-crafted content is an adaptation of another, existing one. For this reason, the superposition of both roles is only partially represented in the figure.

Player: is not a role, but an 'enhancement' within each role. The term refers to individuals who fully use the tools available for and in each level, becoming Player-Audience, Player-Synthesiser, Player-Modifier and Player-Producer. Their actions, especially those not foreseen in the design of the workpiece, shall feed the Producer in future developments. In other words, Players can perceive and learn affordances not foreseen to their level. Players pursue challenging content that makes them, even if individually, think and perform an action. One may identify them (not restrictively) with 'early adopters' or 'early users', that is, those who will assume the risk of using a new technology and, thus, contribute to its development. The AD model tries to predict every user behaviour, but it would be a mistake not to consider unpredicted uses.

Finally, the two arrows at the graphic's bottom represent how the process is comprehended within Media Studies and HCI Studies. The blue arrow refers to the relationship of people with the content, that is, objectives, intentions and meanings implied in (and derived from) enjoying the audiovisual programme. Diverse intellectual traditions are usually combined in such an approach, for instance Cultural Studies, Semiology and Ethnography. It is emphasised how discourses are interpreted and incorporated by people, which may lead to a understanding of the creative process itself. In other words, through Media Studies one starts with a general context to try and understand Producer's motivations – whether economic, cultural or ideological – and so point out his or her intentions. The main advantage in analysing the process of

audiovisual creation using this perspective is to come to acknowledge sociocultural concerns in a given local or historical context, plus how such concerns exert influence (or even determine) choices made by the Producer. Data collected from observation of the relationship of public with programme output are then feedbacked to the audiovisual industry's production chain, apart from becoming the basis for creation of policies designed to cultural development.

Nonetheless, even if the content (format, theme and storytelling) is the foundation of the creative process of an audiovisual product, to consider interactions performed by audience through different interfaces requires the Producer to also contemplate processes and technical and technological courses that will lead to the content.

HCI presents methods and processes that help composing such perspective. The fruition process is divided into steps, planned in accordance to possible engagement an individual will demonstrate regarding enjoyment of the programme and motivation to contribute to the richness of content. This field of studies enables planning and comprehension of the production process of an audiovisual piece by looking at all elements parallel to the content, usually sprang from the technologies employed for enjoyment. That is how the concept of *affordances* becomes necessary. Starting from the production sphere and continuing in the direction of the most passive audience, the HCI axis (purple arrow) allows to underline different demands for a workpiece, by considering its format and technology employed and the more active or less active utilisation individuals will do of possibilities offered in a technological context. For example, a programme that includes a complex interactional system, to be developed for the parcel of audience showing a major engagement level, requires a detailed planning based upon: problem identification, creation of scenarios, survey with selected people, analysis of gathered data, continuous and self-fed planning of usage methodologies (incorporating feedback coming from surveys and first uses), directly applied to development of the audiovisual workpiece. The phase of problem identification is also the phase of documentation of *affordances* of each technological support in which the content will be available. Hence scenarios should be created considering different levels of activity (from most active to most passive) and the selection of technologies (including in production sphere) that may impact in how the content will be perceived by each person.

Thus, the encounter of both theoretical fields helps to explain platforms of work and of circulation, themes and possible spread of audience in each environment and platform delimited by the Producer. On its turn, the act of delimitation is informed by data arisen from the creation process (HCI axis) and data referring social and cultural uses and appropriations (Media Studies).

3 Affordances

As shown in the description of the AD workflow, how the designer or producer aim his or her workpiece to reach different levels of AD-assigned roles, and how they are related among themselves, rely upon the content, the technics and the interfaces that fulfil objectives individually defined by each person. Those objectives correspond directly to the way people get involved with a production (privately or publicly,

passively or actively, as spectator or as co-producer). This requires individuals to bare a 'set of *competencies*' – a concept that will be further explained later in this section – adequate to technological affordances made available by the audiovisual product and its interfaces.

Such conclusion comes from a discussion common to HCI studies, one that observes the best technology learning methods and the perception of resources available in or offered by digital technologies. It is a practicality that good designs, whichever of products, interfaces or systems, must be intuitive, with reduced mental load to users [2, 7], inside technological and intellectual limits and the narrative's aims. Thus, it is pursued a fast, automatic comprehension of resources in each interaction artefact or device. Inside HCI, this discussion is centred around the concept of '*affordance*'.

The term comes from ecological psychology, proposed by Gibson [8, 9] to explain possibilities of action offered by an environment to a given actor. The author developed a theory of perception applied to every animal, including human beings. According to him, animals can perceive how much they can use of and interact with the environment. Available signals that can be recognised by animals are called 'affordances'. Hence Gibson came to conclude that affordances are physical properties of the environment, meaning they can be objectively measured and studied, as well as information available for perception. 'The central question for the theory of affordances is not whether they exist and are real but whether information is available in ambient light for perceiving them' [9, p. 132]. Affordances do not automatically present themselves to actors but must be uncovered through perception and learning. This process '…may require much exploration, patience, and time' [10, p. 17].

Three main constraints can shape affordances: (1) 'Logical constraints' are limitations imposed on the user by rules of action, inherent to every interaction; (2) 'Cultural constraints' are 'learned conventions that are shared by a cultural group', and may be understood as learned behaviours; and (3) 'Physical constraints' are fixed parameters of every interface that can be used to help user's achievement [2].

Norman [2] expanded this line of thought to design, explaining how important is to keep products with a simple and intuitive design to use and learning. The author agrees that affordance is a characteristic of the object, and it rests upon the person to notice it to interact with (or to adequately use). However, to Norman (as well as to Gibson) an affordance does not depend on personal perception to exist, it remains latent until it is necessary in a context. The author says an essential part of intuitive design refers to perception. It is not enough a good design be rational and logical. Excellent and intuitive designs are those that allow one to see, directly and correctly, what is possible to do with the designed thing.

Other authors, however, noticed that good and correct use of complex systems required more than mere existence of *interaction triggers*. Affordance is then, when one considers human interaction, a relative feature of the environment dependent on the individual's perception, which includes previous knowledge, social insertion, cultural aspects, etc. Thus, affordances may vary circumstantially from person to person, being *real* (those accorded to the environment), *hidden* (not naturally revealed by perceptible properties, so for users to determine the existence of most affordances, further

perceptual information must be added), *false* (erroneous indications of possibilities of interaction) and *perceived* (assimilated by the individual) [2].

From Norman's affordances to support users during an interaction, Hartson [11] proposed a classification into four types, reflecting users' processes and types of actions undertook when performing a task. Norman's *perceived affordance* can instead be named as *cognitive affordance*, helping users with their cognitive actions to identify tool's features (recognising what it is and what it is for). *Real affordance* turns into *physical affordance*, aiding users in their physical actions (e.g., pushing, pressing, rolling, etc.). Then we have *sensory affordance* playing an important role in design and evaluation of interaction, to assist users with their sensorial actions (e.g. size, colour, audibility and feel). The fourth type, *functional affordance*, refers to the purposeful action component of physical affordances, which themselves are perceptible and actionable properties of a thing, whether in real world or virtual/graphical ones. This affordance fits in with user-centred design approach, by determining and focusing on the individual's aims and objectives.

These four types of affordances can be mapped back to Norman's action model: the act of passing from an intention of interaction – or identification of opportunity – to planning a sequence of actions requires *cognitive* and *sensory affordances*. *Physical* and *sensory affordances* are related to execution of this sequence of actions: *sensory affordances* are associated with perception of the state of the world, while *cognitive affordances* are necessary to interpret the perception.

3.1 About Competencies

Before applying the concept of media affordances by the AD, it is necessary to make an introduction to the concept of *competencies*, that is, characteristics shown by individuals, whether innate or developed, that are required by the environment and objects' affordances to fulfil an action or a reaction.

Competency is a terminology common to various fields. For example, in Business Administration and Human Resources, it refers to behavioural repertoire and intentions of a person to efficiently perform a given task [12, 13]. This comprehension can be extrapolated beyond workplace, since people must show intention, action and behaviour in every intentionally-engaged interaction. A competency, that is, what makes possible to competently performing a task, involves knowledges, skills and capabilities of individuals, ordered according to behaviours and intentions [13, 14]. We identify as skills an individual's subsets of characteristics that allow him or her to perform an intentional operation. Skills are acquired and developed from the intention of a person to act or react to a situation, thus shaping his or her behaviour during action he or she is engaging with. Capabilities, on the other hand, are 'potential skills' present in subconscious level and not yet developed. Capabilities are inherent to learning processes, an intermediate stage between acquisition of knowledge and using a skill to perform an action or a reaction.

In face of new communicational affordances originated in contemporary media ecosystem, individuals are expected to show new competencies (new sets of skills, knowledge, capabilities and behaviours), or to develop those culturally and psychologically rooted.

Socioeconomic, cultural, technical or technological background may provide elements to compose competencies. AD considers them as related to physical-economic conditions for accessing content; act of fruition, cultural use and appropriation of the message transmitted during the communicative process; how such act of fruition, appropriation and use occurs; and knowledge on required technologies to undertake a giver use. A competency is only effective when skills, knowledges and behaviours are aligned and activate *affordances* of a technology of communication (a media affordance). Therefore, appropriation of theories or notions of operation are not enough to ensure that a person has really acquired the competencies to be categorised into any AD-assigned role. He or she must first incorporate that function during the enjoyment of the audiovisual workpiece. We may assert that the individual effectively moved in between roles only after the process is started. Consequently, there is an opening both for progression and regression of each person between roles, what can be exemplified through the Line of Identity: a person may use every tool available to engage more fully with a programme that touches him or her profoundly, and can be a mere passive spectator to another, with which he or she relate only for entertainment satisfaction. The competencies necessary to occupy an AD-assigned role varies according to production characteristics and how individuals interact. In addition, since one role is contained in another, competencies accumulate from one level to level.

The Audience role clearly requires the simplest and most easily appropriable competencies. For the viewer who only watch audiovisual content in Broadcast model, cultural and linguistic competencies for understanding and interpretation of the message are basically enough. However, when we think about the increasing number of individuals using alternative fruition forms to Broadcast, but still for passive consumption – such as on demand video – skills accumulate. Among the competencies of Synthesisers, we emphasize those related to social media. To create their network identities, Synthesisers are part of communities of mutual interests and act as representations of themselves, hence they become poles within social networks articulated by digital media. These competencies also make evident one's condition as a fan, whose discussions revolve around their active participation in available content activities.

Regarding the role of Modifier, appropriation of technology is fundamental, especially when Producers do not release tools for modification. The appropriation of content that occurs at this level is a cultural appropriation of some parts or of the whole workpiece or technology, including generation of meaning, sense or a different discourse from that originally manifested in the workpiece. The Modifier gets elements from original context, modifies them, or recreates parts to transform them in a representative idea, or even in an ideology. From a sociological point of view, it can represent a very aggressive capability of expression, especially when the group appropriating content is a minority that uses a popular resource to make itself heard. Modifiers can create their own social network, becoming important nodes of content diffusion.

Producers' competencies are more complex, divided mainly between the field of technology and the ability to interpret the users' demands. Except for a few authorial or amateur projects, an audiovisual production usually involves a group of people, thus each person who works at a project, shows his or her own competencies within the area

of expertise. This is common in large commercial products (e.g. writers, system developers, editors, graphic designers). Even if a person cannot master all technologies involved in a production, it is important to be aware of which ones are present to provide a seamless user experience.

3.2 Media Affordances

In a wide perspective, according to AD first the Producer must develop *functional affordances* to incite individuals' interest and call attention to the programme. How other AD-assigned roles evaluate the content – whether it deserves audience, synthetisation or improvement – rely on adequate awareness of value, including subjective elements related to informational value or potential entertainment, and available resources of participation, interaction or sharing. Now, in a narrower perspective, analysis of content and of interaction are directly linked to individuals' level of activity. Alternation of roles depends on correct perception of *physical affordances*, which are associated to the environment and can be:

1. physical, those which can actively be manipulated and potential uses are perceptually obvious, composed by technologies used for content fruition, e.g. remote control, mouse, virtual keyboards, computer screens or TV sets. The environment is relevant because it conceals or reveals *physical affordances*, also impacting on *sensory* and *cognitive affordances*.
2. of interactional graphic interfaces, such as interactive TV menus or 'share buttons' in on-demand video systems. This has always been a paramount subject to development of interactive TV, since deficiency in digital culture (the impossibility of perception of *physical affordances*, consequently eliminating *cognitive* and *sensory* ones) derail the use of complex interaction interfaces by people without technological and relational knowledge of internet [15].
3. symbolic narrative, where *physical affordances* are subtler, and *cognitive* and *sensory affordances* rely not only on technology and interfaces, but also on comprehension of narrative elements. As example, cues and cliff-hangers from a character in a drama serial, aiming at action of one AD-assigned role, or calls to action of hosts in programmes, employing work of Synthesisers. In this case, *physical affordances* can be voice, a song, an image composing a scene, or a set of actualities that stimulates curiosity (that is, a *cognitive affordance*).

Depending on context, some affordances must be noticed only by individuals performing a given role, otherwise action may be prevented. Producers must establish several features (or perceptual cues) to help users recognise the correct affordances.

As for *sensory affordances*, they present two important functions. First, mediation and link between *physical* and *cognitive affordances*, which are necessary to identify the goal and associate it to a possible outcome. Second, perception of elements that describe the affordances, which can be visual, sonorous or tactile. Putting these three affordances together is central to different degrees of action, inherent to each role the individual performs.

Affordances determine the level of interaction within a given workpiece, analysable in accordance with the *axis of comprehension*. Through HCI axis, the level of

engagement and action facing a technology diminishes in each role, inclining to inertia[1] in Audience role – e.g. when the person only watches TV comfortably, almost without taking any action towards the technology. Following this scale, inertia can be total in moments of total distraction, when the viewer does not pay attention to the programme and use the TV set as an environmental sound or company [16]. Therefore, the design of audiovisual workpieces starts from a whole participation (creation/production) to a continuous reduction of actions. As the line advances, strategic functions of HCI resources drop, while relevance of Media Studies increases.

On the other hand, the axis of comprehension through Media Studies involves increasing engagement and action with technology, as the individual develops a more active attitude as roles advance. This is to say that this line starts at inert Audience posture to a higher activity level in every role. The peak of engagement or action is the creative and productive act performed by Modifiers or Producers. The same occurs when one tries to understand narrative complexity and production process domain. While Audience role does not require skills and competencies related to production, the roles with greater activity entail complex actions facing technologies and markets. In this case, the peak of activity is represented by the enhanced role 'Player', which use most of the resources available to each role they are connected to.

Affordances, as approached in the design of audiovisual workpieces, are responsible for calls to action or to inertia, so they form triggers for activity or relaxation. Therefore, we may have Triggers of Action (ToA) and Triggers of Inertia (ToI), which must be considered and included in each phase of design of a production. ToA can be composed by elements of visual signalling, storytelling motivation, narrative curiosity, voice or call for action from a character, desire for more information, game challenges or scavenger hunts, etc. They are subject to a coherent and combined use of the four types of *affordances*, since comprehension issues related to any affordance, even if partial, can compromise the entire experience. On the other hand, ToI normally are present in central points of the story, requiring Audience to present a high level of attentiveness. In this case, perception of ToI may be unconscious, thus not demanding any *functional affordance*. In other cases of increasing inertia (e.g., when the Modifier changes his or her role to Synthesiser), difference of action and of reach of action are conscious to the individual.

Analysing the axis of comprehension through Media Studies, one may note that the first ToA are already present in Audience role, allowing the change into Synthesiser. To understand functioning and reach of action of sharing represents an initial competency of this role. *Functional affordances* are more relevant in this scenario, since they enable decision-making process related to value and outcomes of the interaction. Yet, to move from the roles of Producer, Modifier or Synthesiser to the role of Audience requires ToI, which can be a process more difficult to design.

Finally, it is important to highlight that, to AD, the comprehension of available interaction resources goes through Hartson's four types of affordances [11]. Meanings,

[1] In this essay, the word 'inertia' differs from the concept of passivity, broadly discussed in Communication Theories. While the second refers to how people introject content, the former refers to perception and action in response to triggers and related affordances.

especially of *physical affordances*, must be introjected by individuals. The complexity showed in production and enjoyment of contemporary audiovisual works, inherent to the spreadable communication model mentioned above, rises as many persons perform the four AD-assigned roles, simultaneously or in alternated moments. As a result, roles with greater action level help to develop perception by roles of greater inertia.

Besides, *folksonomy* – the moral economy that drives a great deal of actions and can be considered a motivation for acting in roles of greater action level – also discuss the expansion of meanings among people integrating the same network. Circularity of production, providing that Producers appropriate and replicate contributions by fans that are, on their turn, Synthesisers or Modifiers, is an important and efficient key especially from the second level on (Synthesisers). The outcome of such appropriation improves the entire chain of production, with a design adequate to all roles; including Audience, that even if they show the lesser contribution to improvement, benefits from different generations or versions of the product.

4 Learning Affordances

The initial conceptualisation of affordances presumed learning as unnecessary [8]. By looking at an object one should be able to promptly and mechanically know how to use it. According to Kaptelinin [7], this is the main reason why the term rapidly disseminated amongst HCI designers and planners. Such understanding is valid, for instance, for Audience role, given that actions of watching TV or enjoying an audiovisual workpiece, for example, does not rely on complex technological skills or competencies. The presence of *physical affordances* is limited, being representative for AD only when Audience is changing role to Synthesiser, or when Player-Audience makes use of interactive tools.

However, as stated before, contemporary media ecosystem provides natural environment for people to learn, acquire or develop new competencies. Nonetheless, we must bear in mind at least some of the ways that learning occurs. For instance, the Producer may have to enable acquisition of knowledge and skills by users. The design of a complex interactive audiovisual production must foresee affordances that are learnable by the target audience, intuitively and harmonically with the overall universe of the narrative and storytelling. In other words, if the Producer wants (controllable) groups of Synthesisers and Modifiers under a participative and collaborative sense, then the product (content plus interfaces) must present affordances for people to learn how to develop these roles.

Included or not in the Producer's strategy, other learning scenario is relationship among people, who use formal or personal channels to exchange knowledge and experiences about fulfilment of phases and processes inherent to a mediatic product. Consequently, *functional*, *cognitive* and *sensory affordances* may be referred to in terms of interaction contexts, since exchange of information between people improves overall comprehension.

The media environment evolved exploring learning through the support itself. For instance, the first cinema in the beginning of 20th Century had 'lecturers' and 'explicators' during screening, to introduce the then new media affordances to the public –little

used to the new format. In today's movies, trailers and teasers tangled with marketing actions afford people to acquire knowledge and capabilities to the moment when the movie is brought into fruition.

About learning and use of software, resources such as visual presentation and tour over validation environment are common, aiming to introduce the set of phases and process of use, using both native resources and advanced devices such as cameras, microphones and sensors. The relationship between audiovisual media and computational software can be illustrated by digital games that supply the person with presentation or introductory sections, test of resources and exploration of technical and conceptual environment simultaneously, allowing the individual to establish aptness levels to expand his or her enjoyment and trigger the alternation of roles.

A complex interactive audiovisual workpiece must present affordances that are adaptable, so the intended audience can intuitively learn them. This characteristic possible both if we consider '*in-use design*' and '*for-use design*', given that the Producer offers an environment with designed affordances. *In-use design* stands for discovery of new uses, or new affordances, by the individual while he or she is enjoying content or using an interface; *for-use design* is the discovery of affordances already predicted by the Producer [17]. The first case is exemplified by resources not foreseeing by designers when conceiving artefacts or, according to the approach we are giving in the present paper, during the conception of an audiovisual workpiece's script. Even so, exploration of the environment is an individuals' duty, who may fully or partially comply with it, or even aggregate new meanings. In extreme situations, the person can notice affordances that were not planned by the Producer, making enjoyment of the audiovisual product even more complex. Concerning the Player – the enhanced role responsible for taking the most extreme actions when consuming audiovisual product – the constant quest for novelties encourages creation of new affordances, thus increasing storytelling power. Subsequently, learning affordances (especially *cognitive* ones) is important for a good experience in each role performed by the individual.

The learning process can also be developed through conceptual approaches – e.g. Media Literacy – which propose teaching of social, economic, technical and cultural aspects of media usage, to expand competencies of access, analysis and creation of content. To conclude, the complex nature of relationships between affordances and individuals can be addressed through contributions to interaction design by the Theory of Activity[2], which considers each element via encounter of distinct levels: Artefact > Tool > User interface *Versus* User < Worked < Human Being [18]. That is, the Producer constructs an artefact with a set of affordances to individuals, who construct their connection to the media in accordance to human factors (motivations, experiences), and conduct action to attain objectives and activities. This way, *in-use design* can differ from the scenario predicted by *for-use design.*

[2] Affordances are not really addressed in the Theory of Activity, but this approximation is important for the AD, to understand the complexity of possible actions within each role.

5 Conclusion

This essay has introduced the concept of affordances in Audiovisual Design methodology. The term is central and necessary for comprehension of actions individuals can take when they occupy each role assigned by the AD. It is also important for planning audiovisual workpieces, both in terms of production – when affordances become a tool of action or inertia – and in terms of engagement innate to Synthesiser and Modifier roles. Affordances can be understood as characteristics of an object that can be perceived in its integrity, or that must be complemented by the individual's perception. This analysis is not central to AD, since the model focuses on triggers for alternating roles: a reduction to a level of greater inertia, or a progression to roles of greater activity and engagement.

Contemporary media ecosystem, by converging different media in the same environment, dominated by digital technology, brings new demands for interaction, resulting in the rise of new affordances, related to use of interfaces and computers. Therefore, HCI Studies contributes with analysis of situations in which media consumption takes place, providing methodologies to underline and explain which the new affordances are and how audiovisual production must be organised around them. Therefore, it becomes possible to predict, during the design of programmes, content and interaction interfaces, actions to be taken by individuals. The problem-solution chain of HCI allows the advent of a complex use of different media and platforms, by indicating potential features of each content-distribution channel.

This initial discussion about affordances brought several questions to be approached in future works. First, a detailed investigation and listing of most relevant affordances, accompanied by incorporation of further discussions on theories, especially about concepts of *hidden* and *functional* affordances. It must also be specified how Producers must address to unpredicted uses and appropriation of technology and content, which is already suggested by the Theory of Activity, and the contrast between *design for use* and *design in use* – concepts that must be better incorporated by AD. Such study will help to further develop behaviours and competencies related to Players. Also, future investigations must apply these theories into concrete productions and analysis of actual content, especially to show how competencies are acquired by individuals, and how media affordances can be transformed into real, viable tools. Another line of investigation is delimiting the technologies and affordances required for a full implementation of interactive TV.

Although the AD methodology considers currently available technologies, we must keep an open plan to incorporate new social and technological dynamics that can modify the proposed workflow. We also understand that economic restrictions can render inviable the complete application of this methodology in its full version in every audiovisual production. Nonetheless, Audiovisual Design remains a valid methodological set since it allows to contemplate every phase of the design process as an isolated process. Also, it adds elements to the debate about formation of professionals who will produce this type of content, demonstrating the need for a revision of scholar curricula, especially in careers of audiovisual production, which currently does not contemplate subjects important to the producer of content for interactive systems.

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