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Film and Television Production as Audiovisual Design

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Abstract: Industrial film and television production (FTP) includes many elements of creative work on sounds and images that are best addressed as audiovisual design. Two paradigmatic understandings of design, “design-as-problem-solving” and “design-as-meaning-creation”, have a bearing on these elements. The issues dealt with during FTP work processes, as well as the problems to be solved and the characteristics of the work processes used, resemble issues, problems, and process characteristics within design work. From the perspective of audiovisual communication, both the design and production aspects of a process are considered to make an important impact on a message. In FTP, these aspects are blurred. This paper discusses the benefits of approaching FTP as creation of audiovisual communication, in which design is an integrated part of that process. The benefits of considering FTP as audiovisual design are proposed from a design research perspective.

*Keywords: Audiovisual Communication, Design Issues and Problems,
Design Processes, Digital Materiality, Media Design*

Introduction

Design is used to develop products, services, information, and environment. Audiovisual objects such as films and television programs are products and can be considered from a product design perspective. Every film or television program is unique and is not subordinate to serial production even though they often exist in many copies. Despite the fact that every single production is exclusive, the production system is more or less the same for all film or television productions, in which the same sub-processes recur in all productions. Yet the sub-processes do not always reappear in the same order during each production process. Even so, design applies to a process as well as to a product, including services. With its focus on the user, design can be regarded as a working process in order to develop solutions in a conscious way, whereby innovative and functional requirements go hand-in-hand with aesthetic requirements.

Since design exists in a context that gives the product a specific meaning (Krippendorff 1995), it simultaneously creates meaning for the user. In film and television production (FTP), we will discuss two kinds of meaning-reliant users: the viewers of the final product—that is, the audience—and the individuals who participate in the different FTP sub-processes and communicate with other craftspeople within the production chain about their respective contribution. By using a transparent design process, the FTP team will receive support for the process and will therefore be aware of how small decisions affect the next step in the process.

This paper elaborates upon the idea of FTP as audiovisual design work, using a design perspective on audiovisual communication with the objective of using design theories in the analysis of FTP. The purpose is to highlight some contributions that a design approach will yield when dealing with FTP as audiovisual design in accordance with design theory, in which design issues and problems, as well as design processes, are central (Krippendorff 1995; Simon 1996; Poggenpohl 2009). Earlier usages of “audiovisual design” as a term for FTP within segments of this industry (US General Accounting Office and Dodaro 1988; US Office of Personnel Management 1991), as well as in discussions of FTP processes (Westera 1995), have been either descriptive or conclusive rather than anchored in design theory. Earlier academic writing on film

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production addresses how films are designed for maximum profit and relates a film's design to an intended audience (Wagner 1955; Levonian 1960). In *Audiovisueel Ontwerpen, Theorie en Praktijk: Conceptontwikkeling voor film, video en televisie* [Audiovisual Design, Theory and Practice: Concept Development for Film, Video and Television], Westera (1995) discusses film, video, and television production as audiovisual design. He describes the development of concepts for production and their realization into production as design issues and uses "audiovisual design" as a conclusive term for the work of executing this conceptualization and production process.

By defining design and production strata, as well as the different sub-processes involved, it is possible to elucidate their different contributions to and effects on the final product. The objects of analysis are examples of industrial craft activities within FTP that create and shape sounds and images, primarily as those activities are described by experienced craftspeople from the FTP industry (e.g., Boorstin 1995; Osgood and Hinshaw 2009; Tomaric 2011; Millerson and Owens 2012). The kinds of media production that make use of both sound and image, such as FTP, continue to expand, and increase the usage. Within academia, there has been an interest in film and television for quite some time. There has been interest in film since the 1920s (e.g., Balázs 1926; Eisenstein [1929] 1998), and there has been interest in television since the 1950s (e.g., Smythe 1953; Head 1954; Rosenberg and White 1957). Some of this interest is directed toward how audiovisual phenomena are created in production (e.g., Eisenstein [1929] 1998).² Production studies have emerged as a field studying media production, with much attention paid to FTP (e.g., Caldwell 2008; Mayer, Banks, and Caldwell 2009; Holt and Perren 2009). The focus in these studies is the way in which the economic and social order within media production is influenced by industrial structures, technological factors, organization, and social relations, whereas issues, problems, and process quandaries that arise during the execution of production work tasks seem secondary. Occasionally, these studies touch upon how FTP crafts-people strive for, and find, solutions to such issues, problems and dilemmas.

In design science, the focus is not merely on one activity or the final product, but rather on the whole process and the different stages of the process, from brief, to ideation, to final product, as well as on production systems (Eckert and Clarkson 2005). The results of such an analysis could broaden the current understanding of FTP activities, and situate FTP craft activities within the context of design, to the benefit of FTP educators and researchers. As communicational objects, professional films and television programs are most often produced in an industrial context; they are specific entities with dedicated purposes (Caldwell 2008; Tomaric 2011; Millerson and Owens 2012; Arundale and Trieu 2015). Hence, FTP problems and issues are addressed accordingly, and the industrial perspective informs our approach. A systematic approach looks beyond individual cases and situations, permits an analysis that reveals common conditions concerning the creation and adaption of audio and visuals, and opens prospects for further theory in the field. Such an understanding will yield improved rationale for researchers and educators within FTP, which, in the long run, will feed back into the industry.

In this paper, we will discuss film and television production from the perspective of four design aspects in separate sections: (1) film and television production as design in audiovisual communication, (2) FTP work as design work, (3) FTP issues and problems as design issues and problems, and (4) FTP processes as design processes.

² Several of Eisenstein's texts from that same period touch upon film production matters.

The Need for Additional Perspectives on Film and Television Production

Industrial film and television production has many aspects, and there are a number of different types of work involved in each production. Production usually includes executive work such as budgets, scheduling, legacy issues, and other administration, which we do not claim would be better addressed as design work. Likewise, we disregard production efforts such as acting, catering, transportation, or the work of various assistants as design work. Instead, we specifically address the industrial FTP crafts that create or process sound and images without getting into specific genres or modes of production. We consider FTP crafts generally to be demarcated in such a way that, for instance, the agency of cinematographers/videographers or moving-image editors is essentially the same, whether they work with drama, commercials, or documentaries. This means that they are subjected to similar sets of tasks, even if specific duties and routines may differ from one task to another. For instance, the cinematographer/videographer heads the work of creating the shot—its composition, framing, lighting, movements, and all the elaborations and adjustments of these features, before and during the shooting. Similarly, the editor evaluates the recorded material; chooses the best takes; elaborates the story when s/he makes sequences with flow, rhythm, and logic; and adjusts edits for smooth or harsh transitions. These general tasks are associated with each craft and include sets of activities. The duties and routines of shooting or evaluating recorded material often differ, however, between, for example, a feature film and a television travel show.

Recurring issues and problems within FTP regard realizations of mood, flow, expression, representation, and understanding (Boorstin 1995). For instance, does a sequence feel sad enough with the set pace, or should the lighting be softer to challenge the genre convention to evoke sufficient feelings of sadness in the audience? Audiovisual objects are entities with unique properties that combine adherence to conventions such as genre with novel expressions seeking to attract and challenge the audience (Eisenstein [1929] 1998; Arijon 1976; Osgood and Hinshaw 2009; Millerson and Owens 2012). Audiovisual stories must be comprehensible, engaging, and provide excitement, in one and the same composition, in which each sound or image detail contributes to the complete meaning (Boorstin 1995; Osgood and Hinshaw 2009; Tomaric 2011). Treating professional films and television programs as specific entities, with dedicated purposes produced in an industrial context (Caldwell 2008; Tomaric 2011; Millerson and Owens 2012; Arundale and Trieu 2015), calls for a systematic approach for addressing such creative FTP problems and issues. Likewise, production processes follow general schemes for both television and film (see Figure 1 for an example), where different categories of productions may differ in specific production steps. These processes must be managed to support efficiency and creative efforts (Svenberg and Eriksson 2012).

Figure 1: General Fiction or Advert Film Production Process, Major Sub-Processes Listed

Source: Adapted from Eriksson et al. 2010

Within the field of production studies, most studies of FTP deal with the relations and distribution of power and status between, on the one hand, workers as labour and craft and, on the other hand, management as employer, direction, and administration (Caldwell 2008; Mayer, Banks, and Caldwell 2009; Holt and Perren 2009). These explanations concern the self-conception of FTP culture participants and the core functions of that culture, e.g., dependence on ever-developing technologies or project organization as creating craftspeople's patterns of nomadic behaviour between jobs (Caldwell 2008). In a constantly changing industry of ever-more production of moving images, FTP needs to secure its newly developed knowledge to continue to prove high-quality audiovisual communication.

Another crucial aspect is the success of communications within a production team. In FTP, craftspeople work with manuscripts, directing plans, storyboards, pre-visualizations, and soundscapes as boundary objects for development. Sets, masks, wardrobe, props, and lighting function as such objects during recording, as do the recorded images, graphics, and sounds in postproduction. Every production step is an iterative sub-process that must relate to two things: the overarching artefact as such, namely the communicational object; as well as to the greater process of creating the artefact.

Film and television production processes need understanding that considers communication and transformations during processes as well as accomplished end-quality of products. The processes need specific attention to sub-processes, phases, or stages. Management of such processes with multiple sub-processes that considers knowledge, resource bottlenecks, gates, and deadlines, as well as how sequences of activities may be implemented practically, requires consideration from additional research perspectives.

Film/Television Production as Design in Audiovisual Communication

In the contemporary world of audiovisual communication, where materials are digital with an exceptional plasticity, both design and production make use of the same, or similar, materials; namely, digital media files. When Kress and van Leeuwen (2001) make a distinction between different strata—i.e., domains of practice that contribute to meaning-making—they discuss “design” and “production” as different strata within communication. This distinction provokes an examination of the two strata within FTP. Kress and van Leeuwen (2001) define the design stratum as that in which content is conceptualized and provided with rough specifications. In FTP, the design stratum would be the adaptation of a story but can also include the early stages of identifying desired sound and image features, as well as choosing tools and methods (Arijon 1976; Boorstin 1995; Caldwell 2008; Osgood and Hinshaw 2009; Tomaric 2011). If FTP is analysed from a design science perspective, the whole process is taken into consideration. That includes everything from the brief to ideation and, finally, the audiovisual object, but also the production work. The different strata are blurred in FTP, and the design of an audiovisual object is often integrated in the production process, which can thus be regarded as a part of the design process. Each individual step in the process gives meaning to the audiovisual object and will affect the next step in the FTP process. Nevertheless, it is not only the particular steps that are important to the final product; the way in which the separate contributions are communicated within the FTP team will influence understanding and thereby influence how small decisions affect audiovisual meaning. This can be related to Kress and van Leeuwen's (2001) claim that design is agentive and that the designer stands in the centre of the communication process, exercising individual force and making a specific impact as well as canalizing the impact of the context. These are essentially the same attributes that Caldwell (2008) ascribes to FTP workers as agents in production chains, and what the production literature describes as craftspeople's core responsibilities (Boorstin 1995; Osgood and Hinshaw 2009; Tomaric 2011; Millerson and Owens 2012).

Kress and van Leeuwen define the production stratum as “physical work, whether by humans or machines” (2001, 66). This applies, in both respects, to FTP (Svenberg 2012;

Eriksson 2013). Kress and van Leeuwen (2001) point out that production needs to be specific and detailed in order to be executed. For instance, the character of the light (i.e., its “softness”) fixed before shooting conditions—to the extent the image can be altered afterwards—and the pace of a camera movement will circumstance the pace of the editing. In this case, the open-ended aesthetic problem-solving of FTP reaches an increasing level of fixation on details during the progression of the production process, which is when, and where, the design takes place (cf. Caldwell 2008; Osgood and Hinshaw 2009; Millerson and Owens 2012). In the process of increased detail fixation, the boundary object of that particular production stage—i.e., the storyboard, a set, an image frame, or an edited sequence—is the centre around which the FTP team communicates. The awareness of FTP as a design process and acquiring understanding of fixations in FTP will probably help the team avoid too early fixations that will cause costly iterations later, since design thinking will help them stay in the process and consider design solutions or contributions to the audiovisual object as suggestions that are open for new input. Likewise, it seems that the allocation of resources throughout production processes is gaining in importance, especially if design is part of production.

In addition, the plasticity of the digital material allows for principally countless re-iterations, which again challenges which actions are design work or production. The elaboration of the material is done with the same tools and methods, whether considered as design or production. Thereto, design work is contingent on its domain of practice and on its specific stage, as well as on the border zone between design and its implementation, according to Kress and van Leeuwen (2001). Therefore, the division between production and design is not clear-cut. From a FTP perspective, these are issues that need further research attention, since it is not clear who is the designer, or who is the implementer of a design.

Film/Television Production Work as Design

Industrial film and television production is genuinely a collective endeavour and a social practice, with the combined labour of many competences, skills, and trades formed in temporary project teams that make an impact on sound and image. Interaction between agents of several different crafts can be discussed, in a similar fashion, as design in multi-disciplinary product development (cf. Horváth 2004; Poggenpohl 2009), since FTP is almost always teamwork, with a common effort to achieve a desired outcome—that is, to complete an audiovisual object that satisfies the expected audience (cf. Tomaric 2011). Recurring design principles that have bearing on FTP work moments are either “design-as-problem-solving” (Simon 1996) or “design-as-meaning-creation” (Krippendorff 1995), and often both simultaneously. Accordingly, production teams add to existing situations through collective endeavours, where they develop, adapt, adjust, and alter stories (e.g. ideas, historical events, or scripts) into audiovisual forms, which audiences are assumed to prefer (cf. Boorstin 1995; Millerson and Owens 2012). Such estimations include who the audience is, as well as what kind of comprehension the team should seek for the audience. This is known as “design cognition” (cf. Horváth 2004). Even if a certain understanding cannot be expressed as a specified or fixed goal and has to remain undecided (cf. Simon 1996), each story needs its logic and credible flow, its emotional impacts and its moments of “thrill,” as desired functions (cf. Boorstin 1995; Krippendorff 1995). Without these functions, an audiovisual story loses its capacity to interact with the viewer and eventually will not persist in the culture at which it is aimed, which lines up production and design perspectives (Boorstin 1995; Krippendorff 1995). These FTP aspects can be discussed thoroughly as design problem-solving issues.

Nevertheless, FTP problems are also partly aesthetic problems, since meaning is proposed through audiovisual expressions, though it is affected by internal meaning-creation during the production process (cf. Swenberg 2012). Achieving a logic and credible flow, emotional impact, and moments of “thrill” that match the content of the story become problems to solve with the help of conventions or expressive style in applying and shaping such concrete components as image depth and width, casts, sets, lighting, soundscape, editing, and further postproduction, as described in the production literature (Eisenstein 1929; Arijon 1976; Boorstin 1995; Osgood and Hinshaw 2009; Millerson and Owens 2012). All these activities shape material in order to create meaning by means of design aesthetics (Krippendorff 1995; cf. Horváth 2004). The overarching meaning of the audiovisual object is thus continuously emerging through the FTP team’s negotiations, until the object is fixed for distribution. Nevertheless, for the success of the audiovisual object, it is the meaning for the end user, the viewer, and his/her authentic involvement that is the aim throughout the process (cf. Krippendorff 1995).

In general, each FTP team member needs to analyse the production situation rationally to understand what design principle to use, what action to take, and how to execute his/her activities (cf. Horváth 2004). Sometimes there are several actions or procedures from which to choose, and sometimes novel actions need to be developed to create the proper audiovisual expression and impact (cf. Eisenstein [1929] 1998; Boorstin 1995; Caldwell 2008; Osgood and Hinshaw 2009). Once again, these are issues that are dealt with by means of design problem-solving (cf. Simon 1996; Horváth 2004).

Furthermore, adding audiovisual value to the communicational object is the professional liability of the FTP team member as a meaning-making commission that accompanies each craft (cf. Boorstin 1995; Caldwell 2008; Osgood and Hinshaw 2009). Making-meaning is likewise a core concern for designers, and, as such, a distinguishing feature of the profession (Krippendorff 1995). Additionally, meaning-making is a core issue in design semantics (Horváth 2004). All the above-mentioned design conditions call for the “critical intelligence” (Caldwell 2008), or the design intelligence of the individual, as described by Horváth (2004). The design understanding of multi-disciplinary product development seems to offer a useful horizon for explanation of FTP work that addresses this design-production blur, considering the variety of production activities that are involved, each assigned to a specific FTP agent.

FTP Issues and Problems as “Design Issues and Problems”

The conditions and variety of activities encountered during industrial film and television production work processes, as well as the issues and problems to solve, recurrently include the concrete implementation of representation, expressions, mood, and flow; choosing and elaborating them (Boorstin 1995). These choices and elaborations resemble the frequent issues and problems associated with design work in multi-disciplinary product development, described by Sato (2009) as manifold in dimension, simultaneously concerning actuality, experience, and purpose. The industrial production of professional films and television programs as concrete compilation of specific sounds and moving images with numerous properties needs systematic inquiry into its creative issues and problems (Caldwell 2008; Tomaric 2011; Millerson and Owens 2012; Arundale and Trieu 2015). Nonetheless, when a solution is emerging as one of several options, and its reasoning is exploited, Horváth’s (2004, 163) “problem of bounded rationality” remains a part of FTP. Many solutions are not transferrable to the next production. For moving-image productions, reception and/or use cannot rely solely on convention if the experience of the end user is important to the producer. The viewer’s cognition, emotion, and/or understanding must stay in focus, depending on varying situations and purposes. Mere convention risks leading to predictability, followed by boredom. Audiences and cultural factors, common or specific, are the context to consider when producing. In accordance with MacDonald (2001), the general purpose of engaging the viewer, whether in work, business, entertainment, politics, or some other area, must be honoured. Thus, each story needs a detailed elaboration of

its expression beyond convention. Design theory provides a framework that includes such discussion.

Building on Krippendorff's (1995) understanding of design as meaning-making, films and television programs as audiovisual objects can be seen as interfaces for communication with the audience (cf. Arijon 1976). For each audience, the FTP team must analyse the story, its components, and the estimated effect of their compilation in the early stages of the production, since they want the audiovisual object to flow logically and credibly, to make its emotional impact, and to have its moments of "thrill" in accordance with the content of the story (Boorstin 1995; Osgood and Hinshaw 2009). This requires that expression and emotion be evaluated to support a believable internal world for the communicational object. Tools and methods must be chosen accordingly to have the capacity to create the anticipated expression. These are the means that the "critically intelligent" craftsman, as a design agent, uses to solve design problems of assessing and altering aesthetic qualities for communicational rationale (cf. Caldwell 2008).

The emotional involvement in design is well-recognised and belongs not only to aesthetic artefacts, but also to products that have a more functional purpose (cf. Lewalski 1988; Bloch 1995; Jordan 2002). Cars are an example of this; every brand has its own engine sound that makes one type of car distinguishable from another. Additionally, the sound of the door closing means a lot for the user. Poggenpohl's (2009) description of the earlier and later stages of design processes corresponds well here. In a film or television production's later stages, the specific issues of meaning-making become dominant. As in design work, ideas must be practically implemented into solutions that synthesize all the sound and image components into a coherent compilation, making the story unfold smoothly, comprehensibly and authentically. Then, issues of logic and reason—as well as atmosphere, mood, and emotion—must be integrated and woven together intimately (Boorstin 1995; Osgood and Hinshaw 2009; Tomaric 2011). When the production teams consider how to achieve a certain expression and/or function, sounds and images must be treated according to their possible meaning affordances, which is a parallel to other design issues of diversity, where one meaning direction must be highlighted and its supporting features must be fixed. These issues evolve into concrete aesthetic issues, such as shape, size, colour, texture, and symbolic affordances, just as design issues and problems become tangible, according to Sato (2009). Similarly, symbolic values, in turn, must be related to contexts such as the immediate audiovisual story, genre conventions, distribution conditions, and the expected audience. A design research approach provides intellectual dimensions—concepts and reasoning—that can support the understanding of these aspects of FTP work.

In FTP, it becomes apparent that each activity that involves tweaking aesthetic parameters of each particular sound and image and results in altered expressions includes conscious attention to possible alternative solutions to each task. Each solution makes a direct or indirect impact on the meaning that is enhanced audiovisually at each moment of a running film or television show (cf. Eisenstein 1929; Arijon 1976; Boorstin 1995). For instance, Osgood and Hinshaw (2009) discuss video image composition, in which an image can be composed in a great variety of ways. Thus, camera movement can be added, and lighting can play with shadows, create moods and colouring, and provide style. Additionally, image features and objects must be attuned to concurring sound features and objects, as well as to audiovisual features and objects that occur at other points in time in a film or television show.

However, the rationality of the estimations and choices made are bound to each specific moment of each specific sequence, of each specific audiovisual object, in the same manner as Horváth (2004) describes how the designer must address design issues and problems from a "bounded rationality" perspective. Further, such FTP issues as shot design, camera movements, and lighting options add up to complex problems, as when Sato (2009) discusses the many aspects, parameters, layers, and threads of design work that designers need to attend to concurrently. The FTP craftspeople's elaborations of image and sound features closely resemble Simon's (1996) description of design work as handling complex problems, during which

designers search for information, alternative solutions, and possible new combinations, and for actions that provide support for reaching a goal.

Together, these design theories allow for understanding the integration of multiple sound and image components, their features and relations (cf. Eisenstein [1929] 1998; Osgood and Hinshaw 2009), as well as the integration of different perspectives of multiple collaborative workers (cf. Boorstin 1995; Tomaric 2011; Swenberg 2012). Yet design theories also invite discussion about a communicational object's ontological, phenomenological, and teleological properties, as well as any combination or integration of these three aspects. In FTP, the purpose of an audiovisual object, the story, and the experience of it are always present, as are the issues of whether the audiovisual object's character—its presence as ontological entity—gives a trustworthy impression and feels authentic in its own right, thus staying “invisible” to the audience (Arijon 1976; Boorstin 1995). Hence, when we treat the discussion of sound and image issues and problems that FTP teams have from the point of view of second-order understanding, they become complex matters of negotiation of meaning, function, and appearance, which recur repeatedly during production processes. Yet, again, this design-production blur can be addressed in the same way that these matters are treated within design theory.

FTP as Design Process

The blur between design and production strata in film and television production motivates an examination of FTP processes as design processes (cf. Kress and van Leeuwen 2001). FTP work processes are characterized by negotiations between team members on issues of meaning, function, and appearance, regarding often complex relationships between stories and their sound and moving-image components, as concrete problems to solve. Industrial FTP processes frequently share characteristics with those Poggenpohl (2009) ascribes to design processes, e.g. employing design principles and aesthetic conventions, and the nature of information-sharing or formation of sub-teams (Eckert and Clarkson 2005). Likewise, FTP processes are characterized as creative processes in which stories are adapted into audiovisual forms, sounds and images are synthesized, and expressions are assessed by testing (cf. Boorstin 1995; Osgood and Hinshaw 2009; Tomaric 2011). In this kind of product development, it is customary to use storyboards, sets, recorded images, recorded sounds, and edited sequences as boundary objects for discussion. This trait of internal FTP team communication proffers explorations of common communication process characteristics.

In the unstable world of audiovisual communication (cf. Kress and van Leeuwen 2001), where new technology is constantly emerging, human preferences shift and social relations change, evoking new kinds of film and television productions. These productions come with new situations that include untried expressions and new means of producing things that nevertheless require appropriate tools and methods. Each new kind of production prompts the designing of a new process, just as in design work, that adapts established knowledge and promotes the optimization of acquired tools, methods, skills, and transformations for maximum production efficiency and to minimize the risk of time loss (cf. Simon 1996; Horváth 2004; Vanja 2005). It is common practice within FTP to use test audiences to assess the new product towards the end of its development (Tomaric 2011), which resembles the practice in other types of innovation design.

The understanding of industrial FTP work processes can also use the ideas of drivers, and constraints, from design process research for explaining what is to be done, when, by whom, and by what means, as well as how to manage the process. In this context, drivers can be, for instance, craftspeople's creativity in developing and altering stories and expressions and skills or knowledge of methods, whereas examples of constraints form risk of time loss from technical bottle-necks (cf. McMahon and Busby 2005). The risk of technical constraints within FTP has been shown to be increasing with rapid technological development, when new inventions are recurrently adopted as creative tools, although unfamiliarity with new digital materials prevails

(Swenberg and Eriksson 2012). Another possible constraint comes with the digital material's plasticity, since it allows for numerous re-iterations, which challenges the production workflow (Swenberg and Eriksson 2012). Each design process has characteristics to identify, and no two image production processes are exactly the same either. Nevertheless, moving-image production processes have many procedures in common (cf. Boorstin 1995; Osgood and Hinshaw 2009; Tomaric 2011), and, therefore, we see the value of elucidating FTP processes from a design theory perspective.

Once the characteristics of a process are defined, the process may be decided, and its bottlenecks can be planned and prepared for. This is done by identifying economical or technical issues in time and managing them, which means reducing the risk of technical constraints, economic loss, and decreased end-quality (Swenberg and Eriksson 2012). Design-process management as an alternative allows for allocation of critical resources, such as a design worker's skills and design tools, as well as scarce resources. This can be compared with more complex design projects, in which the design process is divided into sub-projects and the different sub-projects each have their own team.

Once more, it is possible to make a comparison with the car industry, where the R&D department involves several teams with focus on different aspects of the car, such as interior design, entertainment equipment, exterior shape, function, engines, and safety. These teams act within different segments, but since the design process is defined, as are the expected contributions from each team, the teams will work toward the same goal: a car that fulfils the customers' expectations for driving a new car. In the FTP context, this translates into sub-processes of, for example, script development, pre-visualization, lighting, recording, editing, sound design, and visual effects (see Figure 1), in which each sub-process has its critical resources in terms of humans and machines, while scarce resources might be computing capacity and transfer capacity (Swenberg and Eriksson 2012). An optimized flow of procedures whereby agents collaborate with awareness of each other's tasks makes the FTP process more efficient, just as it does for the design process. Nonetheless, things can happen that are not anticipated, but must be dealt with as they occur (Tomaric 2011). Thus, we must regard what Simon calls "estimation under uncertainty" (Simon 1996, 27); i.e., not everything in every design process is predictable or known beforehand, and clarifications and corrections are made as a process evolves. Estimations and uncertainties can either be seen as part of a dynamic process or be regarded as deviations from a project plan.

Design process models often include the possibility of sub-processes, phases or stages, which are useful in FTP (see Figure 1). Many industrial film and television productions are organized that way. Here, the use of workflow models that predict resource bottlenecks, gates, and deadlines can be utilized (Arundale and Trieu 2015). Furthermore, the planning of how sequences of activities may be implemented practically is also relevant to FTP. Film production processes have recently been the object of study from a design-process optimization perspective (Swenberg, Eriksson, and Eriksson 2012), with results showing that workflow management tools can improve production processes. Such design instrumentation is recognized as an area of its own within design research (Horváth 2004). The more sophisticated the tools become, the more urgent those issues are, which is the situation within FTP. Moreover, it is important that the tools used in a FTP design process are dynamic yet transparent in order to facilitate production development.

The interest within design research in new knowledge, knowledge transfer, and survival of knowledge from earlier projects and processes, so that it can be maintained and re-used within the design society, also has a bearing on film and television production. Much knowledge is lost in those domains (Caldwell 2008), which is an urgent matter for further research. The more changes the film and television industry undergoes, the more urgent the need for this research becomes. For many projects in this industry, it is a crucial matter to be able to increase the amount of expertise, and this need can translate into issues to be addressed within design

research (Swenberg 2012; Eriksson 2013). Results from such research could contribute significantly to better allocation of resources in FTP processes for meaning-making, and thereby to more proficient audiovisual communication.

Concluding Remarks

In the introduction to this paper, we stated that design is a working process. In FTP, there is no sharp division between the designing of the product and the production process. The design process overlaps almost the entire production process. There are benefits to considering film and television production as design processes that include activities in which sounds and images are crafted as audiovisual design work. The problems and issues encountered by FTP craftspeople when working with sound and image features have parallels in design issues and problems regarding both problem-solving and meaning-creation. Likewise, industrial FTP processes have much in common with design processes, and design-process management theory promises to provide useful input when FTP processes are studied.

Figure 2: The overlap between the design and production strata within film and television production—in which materials, tools, and methods in use; processes to address; and agents involved are similar—blurs the line between design and production. Considerations to be made during FTP craftspeople's work, characteristics of the work, and principles in use are recognized as design-work considerations, characteristics, and principles.

Source: Swenberg and Eriksson 2018

First, there are no strict strata for design and production, respectively, within FTP (see Figure 2). Much of the work that can be considered design takes place during production. The same FTP craftspeople perform design work, with the same tools and methods, processing the same digital material, while they produce, and deal with issues and problems during production. In that way, they make their design impact on the product.

Second, FTP craft activities can be identified as collective and social practises, similar to design work. It is team work with recurring discussions, iterations, and common goals for the created product. FTP craft activities make use of recurring design principles: aesthetic problem-solving and meaning-making. Core issues that these activities revolve around are how to shape particular sounds and images and match them together to support the intended story. Each FTP craftsman must be able to exert design intelligence as s/he makes choices and creates and alters appearances of images when meeting the expectations on the audiovisual object. S/he must know

her/his tools and methods and when to use the right procedure, as well as being skilled at performing.

Third, issues and problems recurring in FTP have similar, corresponding issues and problems within design. Specific issues and problems within a FTP process may not be transferrable to the next project, which resembles design processes. Nevertheless, the same kind of issues and problems recur in both design and FTP contexts, and industrial settings permit systematic approaches. Design issues and problems regard both usability and experience, which resembles the purpose and involvement of viewers of film and television. FTP craftspeople must attend to both the logic and flow of a story, as well as its emotional engagement. As in design, the detail level of FTP then concerns concrete issues of the sound and image aspects of an audiovisual object, such as shape, form, colour, and tone, which results in complex problems.

Fourth, design-process management theory can support the understanding of FTP processes. FTP processes have many aspects in common with design processes, such as process characteristic information-sharing and the sub-division of teams. In design processes, one can identify “drivers” and “constraints” that have parallels in FTP: craftspeople’s creativity and skills are typical drivers, whereas the risk of technical roadblocks and production bottle-necks are recurring constraints. Design process models are a promising means to clarify and plan FTP processes. Many constraints can be avoided this way. Design-process management also provides support for knowledge records and knowledge transfer between processes. It is a recurrent fatigue within FTP not to manage such records and transfers, and a lot can be gained from improving this situation.

To address some of the work, activities, and processes that take place when film or television is produced, and to recognize the different craftsmanship involved in the design and production process, we suggest that core aspects of sound and moving-image creation be elucidated by using a design perspective when analysing and producing film and television.

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