Identifying affordances in Adobe Photoshop

An investigation into the theory of affordances and its use in software analyses

MA Thesis

Herman van den Muijsenberg

3811123

Utrecht University

New Media & Digital Culture

Dr. Ann-Sophie Lehmann

Second reader: Dr. Isabella van Elferen

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Preface

Contemporary visual culture is highly diverse. Its images diverge depending on medium, intention, audience and technology. Yet, when considering digitally made images there seems to be some sort of uniform aesthetic that ties together many instances. Depicted realities blend aspects from different worlds into a single smooth reality. Commercially produced static imagery tends to follow the trend present in the moving images of for instance television advertisements. Here, perfect realities are propagated, in which digitally polished cars, drive through three-dimensional rendered landscapes and where models with retouched body features sell consumer goods. They present us with environments that surpass the physical reality that surrounds us. Still these *hyperreal* properties are communicated as authentic and completely accepted images (Beaudrillard). Static advertisement in magazines, newspapers and on billboards often draw on the same aesthetic.

A related example of the increasingly uniform image culture has been pointed out by media theorist Lev Manovich (2006) who has written on the convergence of production methods in movie culture. He talks about a *hybrid* aesthetic that rose during the 1990s after different media for moving and still image production migrated to the computer environment. Manovich argues that "This aesthetics exists in endless variations but its logic is the same." (2006: 26) It is a similar attempt of including technology in a debate on aesthetics that I am interested in.

A notably aspect that unites digitally constructed images is found at the moment of their production. Fact is that the majority of these images are produced using a limited set of software applications. Most importantly most of them are edited with the image editing application Photoshop®. A piece of software whose ubiquitousness was confirmed with its inclusion in the Oxford English Dictionary in 2007. Being as widespread as Photoshop is today among both amateurs and professionals alike, a multitude of ways to use the software is enacted on large scale. As such I believe that this particular software is ought to be studied thoroughly.

The present research is a preparation to assist such research. Most notably I discuss the term of *affordance*, a concept that I believe to be key in further investigation into software applications.

"If what we perceived were the entities of physics and mathematics, meaning would have to be imposed on them. But if what we perceive are the entities of environmental science, their meaning can be *discovered*."

<div align="right">(Gibson 1979: 33 – italics in original)</div>

Introduction – Connected affordances

To many, Photoshop is a tool. One, which like any, may be used to create all sorts of content. As the possibilities of the digital are wide in practice, yet on a fundamental level very specific, I suspect that there is more to Photoshop than labeling it as a tool might suggest. Its design holds both explicit and implicit cues for the appropriate application of its features. Similarly the language that it communicates through may navigate users in a certain use of the software. To accurately view the possibilities and restrictions of Photoshop in its practical application, the artifact must be investigated using the proper theoretical language.

In order to analyze the impact of software artifacts on the actual images created by them, an in-depth analysis of Photoshop is required. But when such an attempt is made, a firm methodology has to be formulated. Several authors have commenced on a similar investigation studying the so-called *affordances* of software. Inspired by debate in the field of design studies, the concept has been popularized in a way that has drawn critical attention (Norman 1988). Some attempts for a new definition sprouted (Gaver 1991, McGrenere & Ho 2000). But the debate has not calmed down as analyses are still based on different understandings of affordances. (Gillespie 2003, Klopfer & Squire 2008) My research therefore holds the specific focus *redefining the concept of affordances with the prospect of utilizing it in further investigation of software like Photoshop.*

Software like Photoshop requires interaction in order to be significant. A computer is only able to communicate its possibilities and restrictions at the specific moment when a user (usually human) is met in interaction. Conversely, digital devices increasingly 'interpret' and react on user's behavior. To understand this rather young relation between man and machine, researchers have been investigating topics involving both actors. Their collected efforts are assembled under the term HCI (Human-Computer Interaction). During the loosely 35 years of its existence, the topics debated in HCI have increased significantly ranging from interaction design to social ergonomics and

communication studies.[1] Although such specific subfields are beyond my scope, it is still on this precedent of human-computer interaction that I start my inquiry. I aim to specify these actors and where necessary introduce others. Apart from the individual photographer working with Photoshop, other tools, coworkers, and cultural conventions influence the image-editing process. Focusing explicitly on the interaction between actors I want to uncover the infrastructure of movement that constitutes the complex reality surrounding the act of working with Photoshop. To do so I will draw on the fundamental concept of *affordance* and integrate it within the language proposed by *actor-network theory*.

A few words of theory

To make sense of how the great many of features found in software are used, authors in HCI have drawn on the theory of affordances, a concept fundamental to visual perception and human cognition. It was in the context of experimental psychology that James Jerome Gibson first coined the term. Focusing on visual perception he introduces the term to describe the relation between an animal and its surroundings. It is that "... what it [the environment] *offers* the animal, what it *provides* or *furnishes*, either for good or ill." (Gibson 1979: 127) Although defined very generally, the concept is highly valuable when drawing out an artifact's properties and effects. It is for that reason that the concept remains very popular in the practice of industrial design. In tools, such fundamental relations are readily evident. A hammer affords hitting with. Similar statements can be made about tools (previously) used in advertisement agencies and design studios. Like such analog tools, image-editing software may incline a certain inherent use that can similarly be described using affordances. As a result the concept of affordances may serve as a way to test and improve usability in the same way that this is done in the world of industrial design (Norman 2002). More importantly, the concept is functional when explaining an artifact's control over user behavior (Hutchby 2001). Finally it "...allows us to focus not on technologies or users alone, but on the fundamental interactions between the two." (Gaver 1991: 83) All of these applications start with the observation of the artifact in use.

When concerning analog tools, the identification of affordances is often an unconscious process. For thousands of years we have been using hammers. We know exactly how they 'behave' and what they allow us to use them for. The digital environment however is relatively young. Digital artifacts behave according to a new set of rules and conventions. Tools, being part of the environment obey different laws. The label of *tool* itself might be questioned and affordances are easily confused with related ideas in design. As a central theme

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[1] The many faces of HCI have been recognized early in the field's development. This is exemplified in the many publications of collected essays on the topic – one of the most influential ones being *User Centered System Design* (1986) by Norman & Draper (eds.).

in HCI one would expect a redefinition of affordances to have settled among academics and researchers. But despite many discussions we find ourselves still without consensus on this major theme in HCI. In this research I shall add to the debate and test my understanding of the concept of affordances and its application in HCI. I will do so by analyzing a number of aspects in the digital artifact Photoshop. As the latter is my main concern, the definition proposed here will serve as a specific guidance. As such it too will be open for further debate.

An extended vernacular

An investigation into the concept of affordances focuses on *doing* relations, interaction between actors, between human and non-human. As a result a uniform vocabulary that applies to both theory and practice should be utilized. An essential vernacular of terms including tool, surface, artifact, affordance and actor. Using this terminology I will draw out the actors most relevant to the act of working with Photoshop. Just as new actors may be found within this process, new terminology can equally be expected.

One term I will use in the following chapters, does not relate to the object of Photoshop, but to the methods used in thinking about such an artifact. It is the idea of *paths*. I propose this term to indicate different strains of connections found in the network under consideration. These strains become apparent only when the reciprocal elements in several collections of actors are found to move in a way that in itself relates to other (collections of) actors. Typically this means that a collection of relations will differ from another. "Paths" are then a way to visualize this collection as a unity that can be described as such.

The main structure of this thesis is build to trace three of such paths within the network surrounding Photoshop. After defining the concept in the following chapter I will start the analysis by pointing out affordances in Photoshop. These form the most fundamental group in establishing the arguments that I am after. A second path consists of those elements that referring to Donald Norman I will indicate as *design principles*. It is here, surrounded by interpretative actors that interaction is probably most consciously directed. Lastly I will cover the metaphors present in (and related to) Photoshop. This inquires the surface level of the software. All three moments will be trans-disciplinary as they are simultaneously concerned with the material and the phenomenal and include actors from all apparent work fields. Formulating a new assembly of actors I intend to facilitate further investigation into the role of creative software on its products. For the questions about the effects of these relations remain to be sought out. The present research is rather an inquiry of the nature of such relations illustrated by specific examples.

Chapter I – Positioning affordances

Prior to the analyses of the Photoshop software, a more specific account of the theory of affordances is necessary. It is prerequisite to know its characteristics before identifying them in Photoshop. Literature describing the concept is however rather ambivalent about its definition. They tend to contradict each other on key aspects such as the relation between material and phenomenal. In the following I will trace the key aspects of affordances, and specify them where needed. I will strive for a single but poignant understanding of affordances useful in future software investigations.

Environmental affordances

The concept of affordances was first formulated by the psychologist Gibson. He coined the term to describe the relation between "…environment and the animal in a way that no existing term does." (Gibson 1979: 127) He does so in the book *The ecological approach to visual perception* which aims to describe the processes at play when perceiving in the natural environment. Seeing the world around us as ecology makes it possible to find meaning in it "of a new sort". "If what we perceived were the entities of physics and mathematics, meaning would have to be imposed on them. But if what we perceive are the entities of environmental science, their meaning can be *discovered*." (Gibson 1979: 33 – italics in original) Gibson explains a direct perception of affordances, situating meaning not only in the physical object nor in the phenomenal subject. Gibson rethinks these concepts in both the human (animal) and the environment and comes to a kind of hybrid perception. Affordances thus cut across this dichotomy of Cartesian dualism. (Gibson 1979: 129) It is this aspect that sets affordances apart from earlier, related terminology found predominantly among protagonists of Gestalt Psychology. Kurt Koffka for instance situates the perceived value to be completely phenomenal and subject to interpretation. Gibson instead argues that "the affordance is […] always there to be perceived", regardless of attendance by a specific observer. (Gibson 1979: 139)

Splitting hairs

A year after the publication of Gibson's psychological piece, another work pointing out the agency of objects was published in a more technical field. Langdon Winner wrote a piece on modern material culture in the light of authority and power structures. Pointing at the architecture of overpasses in the Long Island road-system, he mentions the political implications of these structures. Building lower overpasses influences the use of roads, allowing only vehicles of a certain height to pass through. That this relation between object and user can be a political and even ideological one becomes clear after Winner's research on the architect. Winner found that

"Automobile-owning whites of 'upper' and 'comfortable middle' classes, as he [architect Robert Moses] called them, would be free to use the parkways for recreation and commuting. Poor people and blacks, who normally used public transit, were kept off the roads because the twelve-foot tall buses could not handle the overpasses." (Winner 1980: 124).

Apparently not only objects from nature had a guiding function in behavior. The Moses bridges seemed to promote a certain ideology. They were described as artifacts with politics – hence the title of the Winner's 1980 essay. It resembled Gibson's ideas about affordances to the extent that objects where seemingly regulating users on their own. The example then would in the years hereafter be used extensively in papers and classes about science and technology studies. This paved the way for a new thinking, perhaps even the "meaning of a new sort" which Gibson has mentioned. Although not mentioning affordances as such, Winner thus had a significant influence on the acceptance of the term not much later.

The concept of affordances had not appeared in design handbooks until cognitive scientist Donald Norman published his standard work: *The psychology of everyday things"* (1988)*. In it he popularized the concept of affordances describing it as a way of understanding how to operate a device never encountered before. In that role affordances were introduced in the field of design theory alongside other concepts like constraints and conceptual models. Norman worked in La Jolla, California alongside Gibson for a number of years. Norman was "… able to argue with him for long hours." and he "… came to appreciate the concept of affordances…" (Norman 1999: 39) Where Gibson however believed in the direct perception of affordances, Norman describes the interaction with one's environment as a process of multiple steps. Norman hardly gives a clear definition of affordances but uses the term in the process of cognition. In relation to operating a door he explains:

"We expect to find some visible signal for the correct operation: a plate, an extension, a hollow, an indentation—something that allows the hand to touch, grasp, turn, or fit into. This tells us where to act. The next step is to figure out how: we must determine what operations are permitted, in part using the affordances, in part guided by constraints. " (Norman 2002: 87)

Affordances here is synonym to "possibilities". Whether these possibilities are located in the physical or the phenomenal remains rather vague. Without further elaboration on the theoretical aspects of the concept, Norman uses the term as a signifier of material options in his examples.

The book that communicated this idea, *The psychology of everyday things* (later revised as *The design of everyday things*) became a bestseller and his practical

description of affordances stuck with many designers. In the notes section of *The psychology of everyday things* Norman acknowledges that his view differs from that of "Gibsonian psychologists" but states that "…this internal debate […] is of little interest here." (Norman 2002: 219) In the 1999 article *affordance, conventions, and design* Norman however has to reconsider. Here he speaks his dissatisfaction with the widespread use of the concept. As the concept was (not exclusively due to Norman) poorly defined, people used affordances in situations never intended. This then posed a threat to the previously so readily used concept of affordances.

The 1999 article however does not help much. Instead of clarifying the concept, Norman adds a second problem by only loosely translating affordances in real-world design to digital design. Norman tries to resolve both issues with a single solution: the splitting into two affordance concepts. confusing the two problems, it seems that he came up with an even more confusing answer. By pointing out this error I hope to pave the way for a more concise definition. One that is in accordance with the underlying framework of the actor-network theory I will draw on in the following chapter.

In *The psychology of everyday things* affordances are placed in a list with "principles of good design", this remains unchanged in the 2002 version of *The design of everyday things*. (Norman 2002: 181) This is where the trouble begins. For it is confusing to find the concept among other more practical ones: visibility, constraints, natural mappings and feedback. Moreover, some of the other principles are equally misplaced. The latter two are actors that influence the communication of affordances. As such they are surely related to the concept but by no means to be structured under the same umbrella term. They have very different roles. Let me explain by an example frequently used by Norman.

> A simple door affords opening. The subsequent hole in the surface affords traveling through. This is not because of a cultural convention or conceptual model telling us what to do with it. Doors are *in essence* operated similarly in different cultures. They may differ perhaps in style. Nor is it a result of the mapping of controls. Shaping a handle so that it signifies pushing is not essential in opening a door. At most it prevents us from making the same mistake over and over again. Neither is it a matter of feedback, a principle that only shows up when concerning more complicated mechanisms that communicate their effects. To stick with this example, consider a door that indicates the duration of it being open after a button is pressed. This again by no means influences the simple fact that it can be opened and gone through.

Rather than being a principle of good design, an affordance precedes those principles. It is defined by such aspects as the material and functional layout. Mappings and feedback can merely reinforce or obscure an affordance. They are

like color, texture and shape irrelevant to the affordance itself. (Gibson 1979: 128) They are processes parallel to those at play in affordances. Both influence human behavior but they do that in different ways. A door does not afford *easy* opening, just like it does not afford opening for 10 seconds. Those are not affordances but parameters at work in addition to the actual affordance of opening and traveling through.

Similarly a constraint, also to be found in Norman's list, is no actual strategy of creating good design. It is rather a way to describe the effects of those principles. Putting it side by side with affordances devaluates the latter even more as it implies the simplified connotation of the duality: "things that are allowed and things that are not". Visibility too is a concept describing the sum of effects the affordances and design mechanisms have on the interaction with an artifact. It is easily confused with "visual perception" which is an example of a very basic affordance.[2]

We now distinguish two strains of connections between artifacts and human behavior. One of which is the object of design as Norman speaks about it. This includes design strategies (or "principles") like mapping and feedback. This is however not the domain of affordances in Gibson's understanding. Instead these instances are concerned with the communication of affordances. The other is a more essential process, which does include the construction of actual affordances. Mind that this is not to say that the latter cannot be designed. It is merely a different aspect of design, one that seems to be only of secondary concern in Norman. It is related to choices in material, composition and basic layout of a surface. (Gibson 1979: 127) I am not suggesting that Norman completely misunderstood the concept of affordances. For his first example when introducing the concept is exactly concerning that described above: properties offered by the material.[3] His subsequent use of the concept however is not consistent on a semiotic level.

Norman does notice the distinct paths in design, but fails to distinguish them as separate processes. In his 1999 article *Affordance, conventions, and design* he attempts to fit the concept of affordances to both paths. He claims that where he said affordances he should have said "perceived affordances". Which opposes the concept of real – or physical – affordances. The concept thus is split into two contrasting ones. The first of which he relates to his prime concern of how design can be 'tweaked' to optimal usability. The latter, "real" affordances are characterized as related to the material of an artifact and are as such hard to

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[2] Gibson describes the medium of air as affording locomotion, sound, odor, and "When illuminated and fog-free" visual perception. (Gibson 1979: 131)

[3] Norman quotes the example of panel shelters for railroad users from Mayall. Using glass afforded breaking but upon replacing the surfaces with plywood panels the vandalism problem did not disappear. Its affordance changed to writing on and carving in.

adjust on a later moment. This definition of affordances as inherent to the material reminds us of Winner's story about bridges. The 'real' affordances are a way to describe the mechanism by which the artifact has politics. Where his previous use of affordances was hard to situate on the physical-phenomenal bias, Norman's adjusted concepts now seem to correspond completely to these respective poles. When recalling Gibson's ideas about affordances we notice that a "physical affordance" would however be a contradiction in terms. "It is both physical and psychical, yet neither" (Gibson 1979: 129) Additionally a "perceived affordance" is not a certain kind of affordance. It is the process in which the user becomes aware of the affordance. It appears that when Norman tries to redefine the concept, he relapses into the Cartesian duality that Gibson so proudly eluded. The split in affordances is a concession to the inappropriate use of the concept rather than an explanation of its proper meaning. The article unjustly speaks of different kinds of affordances and additionally reinforces the idea that affordance is just another design principle.

Norman's objective is of course different from mine. While I am inventorying actors in the use of an artifact, he seeks to establish and explain a list of principles that are useful in developing user-centered design. In this process he correctly mentions affordances, mappings, feedback, visibility, constraints, mental models and conventions but the relation between them is not made explicit. And although not his prime concern, the commotion around the use of affordances proves that a proper revision of the concept of affordances is important to his objective as well. Instead he leaves the impression that (perceived) affordances, constraints and visibility are applicable to design arbitrarily. The different concepts demand explanation not only in relation to one another, but even more so in relation to the artifact. In this context I propose that what Norman calls perceived affordances is understood as the effect of design principles. By including affordances in a list among feedback and natural mappings, Norman already acknowledges this role in design.

Affordances (as no definition is given, still in the Gibsonian sense) and principles in design are two of the different paths described in the introduction. To fully understand their role, we should take a brief look at their relation. In the above we have already drawn out that design principles communicate and elaborate on affordances (cf. the door example). These design principles are consciously included in the development of cultural products. While conceived in the minds of the developers team, the affordances of the medium and material are *actualized*. Affordances therefore precede interpreted meaning and are negotiated on a more essential plane.

When we recall the famous story by Langdon Winner, the processes that regulate and carry out ideology can now be reevaluated. Apart from the dissension about

the truthfulness of the story, Winner's claim is viewed in a new light.[4] When he claims that technologies and their structures hold social consequences, Winner really skips a step in his argument. Artifacts can indeed steer a user in a certain direction. They hold affordances relative to our general behavior. Latour, when revising Winner's article points out that this "does not mean that they have politics —at least, not yet." (Latour 2004) Artifacts only have politics after they have been actualized.

Affordances of the digital

Still a proper definition of affordances is required. From Norman we learn that in such an endeavor the artifact should be considered. As long as one regards nature – in the way Gibson did – the situation of affordances holding the middle between the physical and phenomenal is rather easy to retrace. Air affords (is for) breathing and seeing through. Such basic property description is hardly just subjective. Nor is it objective as not all animals live on oxygen. The meaning of air to the human being though is a universal one. No value or interpretation is imposed by users of air. In the present text we deal however with a different kind of environment. Affordances have not changed – for they are still part of the same world as Gibson's natural examples. They are however harder to distinguish from meaning and values. Many actors claim their agency and affect meaning. Our present object is an artifact (Photoshop) made by man in collaboration with other man-made artifacts (computers).[5] These are subject to again other actors found in culture and society. Only a few of these relations refer to the affordances of artifacts as understood in Gibson's terms. Most of them affect cultural meaning production and are reflected by values. Every time meaning is produced culturally, the discussion begins by affordances but quickly extends beyond them.

Exploring the potential of affordances in ICT Grainne Conole and Martin Dyke also argue for an understanding of affordances, away from the popular formulation by Norman. They show that the practical application of presentation software and hypertext requires a broader definition. Norman's physical or perceived affordances "… represent a passive response to objects rather than a creative engagement with them." (Conole & Dyke 2004: 302) As an alternative they draw on computer scientists Joanna McGrenere and Wayne Ho who move beyond Gibson's notion of affordances. They focus on "undertaking affordances" and propose a framework in which they draw out the various degrees of affordances.

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[4] While Woolgar & Cooper have questioned the fact that New York overpasses regulate tall traffic (1999: 434), Latour writes that "…there is no doubt when you drive along New York parkways that, to this day, parkways bridges are indeed low, so low in fact that trucks and buses still ram into them regularly." (2004)

[5] For an elaborate definition of artifacts similar to its understanding in the present research, consider the work *Artifacts, Art Works, and Agency* (Dipert 1993).

A focus on doing actions is indeed important when considering affordances in general. Indeed this focus should still be highly valued. I disagree however on the understanding of a gradual variety of affordances. McGrenere and Ho attribute this gradual measurement to visibility. The amount of information available in the software's Graphical User Interface (GUI) is decisive. (McGrenere & Ho 2000: 7) I argue conversely that visibility is rather a variable describing the effect of design principles. In the case of a GUI, these are the available information. These principles then, in turn, communicate affordances.

So instead of, or rather before, going beyond Gibson we should value the concept of affordances in its most basic form. Even in the case of software, an environment which may seem so distant from Gibson's natural discourse, we can learn by zooming in on the essential aspects relevant to affordances. Software may easily be considered a product of mathematic calculation, but it can too be seen as an ecology of interacting parts.

In *The ecological approach to visual perception* Gibson starts by analyzing the very basic aspects of the natural environment. Interesting enough these terrestrial aspects bear much resemblance to the terminology of digital environments. And with those used in Photoshop in particular. Gibson's description of "substances" (e.g. rock, sand, minerals, plants and animals) present in the medium of either air, ground or water, are much like the diverse software applications residing in the environment of the digital medium. "Substances are more or less resistant to deformation [cf. software develops into stable builds] […] and they can differ in chemical composition [cf. the many programming languages of which software consists]. Substances in turn consist of textures and opacity. These exact terms both signifiers of frequently used variables within Photoshop. The program's windows hold similarity to the "vistas" which are also found in substances. Additionally Gibson speaks of detached (displaceable) and attached (fixed) objects. Here a comparison with the equally diverse items found in Photoshop is in place. Some of these are fixed and only available through the menu structure. Others can be repositioned, as they are collected in panels for instance. Even the word interface, today so often frowned upon because of its inconsistent application in HCI is defined quite usefully by Gibson: It is the surface where two media come together. Gibson for instance speaks of the sea's surface as the air-water interface.

Comparisons between environments can thus be drawn from nature to Photoshop's internal structure. I argue that affordances whether understood in the natural or digital environment, only apply to such fundamental instances as structure, organization and logic inherent to the artifact. As soon as their design shows I will identify them as a member of a different path.

In order to test my argumentation on the concept of affordances in an analysis, a definition in accordance with the above claims is required. My definition

deviates heavily from those formulated since the popularization of the concept by Norman. Splitting it into separate understandings did not prove constructive for the usability of affordances. Instead I argue for singular yet poignant formulation. Additionally, other definitions have repeatedly moved away from the original formulation by Gibson. Efforts to redefine affordances in a digital context equally move away from the original concept. Sticking to most of the initial meaning, I understand affordances to be the conceived properties of an artifact that, on a fundamental plane, evoke potential interaction with a generic user. To stay close to the original does not equal a simple definition. Instead it points at several aspects, which I believe are central to affordances.

The concept of affordances is now understood in a broad context yet it can be taken to function in analyses of specific artifacts. I will take it as a starting point for the discussion of Photoshop below. In the next chapter I will start by pointing out affordances in the software. Chapters III and IV will then continue the analysis while moving beyond the encountered affordances.

Chapter 1.5 – The material of a digital platform

Affordances, as relating to fundamental properties are most easily specified in a medium. Based on Gibson's understanding of the term, a medium is fundamental to any ecology. It affords the most basic possibilities and restrictions in the environment. "Air affords breathing […] it also affords unimpeded locomotion relative to the ground, which affords support." (Gibson 1979: 130) Such an approached taken to the digital medium is already acknowledged by authors like Eric Klopfer and Kurt Squire who write about affordances in specific combinations of software and hardware. They have started to describe digital affordances in such basic terminology as *portability, social interactivity* and *connectivity*. (Klopfer & Squire 2008: 204) In the present argumentation we need however a practical understanding of affordances specifically in software. This is what Janet Murray does in her book *Inventing the medium* (2011). Murray identifies the stumbling blocks in designing software. Her concern is the dominant lax approach to design of digital environments. She counters this approach with many practical leads. As such she is not only concerned with affordances but also with design principles. For many of her examples that follow from these affordances are in fact related to choices in the design of the software's GUI or structure.

Digital material

Drawing on several media-specific affordances as pointed out by Murray, I will investigate the main affordances of Photoshop, focusing not so much on the medium in which it resides, but rather on the affordances as encountered in the interaction between material and interactor. But what is the material when considering a digital application? To this question many answers have been uttered.

After a period of emphasis on the digital as immaterial resulting in a *digital mysticism*, the last decade spurs a proliferation of the idea that the digital is "no longer considered as being 'out there' but rather as being 'here and amongst us'." (Van den Boomen et al. 2009: 9) Recent debate too acknowledges the importance of both material and immaterial aspects, but continues to look further. Like the present research it focuses on the practices in which digital media are used. Although many different discussions and viewpoints of such understanding are still possible, the writings agree on the demystification of technologies. They do so by broadening the scope with which such situations are approached. A collection of viewpoints on materiality is found in the edited volume *Digital Material* (2009). The authors denote that what in Gibson was purely material, needs to be understood in a broader sense: as a *material assemblage*. (Van den Boomen et al. 2009: 9) Although practical examples are inexhaustible, the material assemblage can in my understanding be divided into three categories. The first of which is close to Gibsons natural material. It

consists of the properties offered by physical objects. Think of software always being enclosed within physical data carriers, as such being "in-material" (Schäfer 2008) and the internet data being not 'up in the air' but stored on servers all over the world. Second is the aspect of code. Everything communicated from within the digital, in essence consists of code. A comparison with DNA is therefore in place. (Schäfer 2011) Lastly material aspects may also reside in conventions formed around, by or within the digital environment. Think of the desktop metaphor on which the most popular operating systems are build. A collection of metaphors, code and affordances has been reiterating the material aspects of a physical desk. Folders, files and even post-its can be placed on top of them. Further discussions that follow this approach of material assemblages include discussions of wetware and 'dirty technologies' (Taylor et al. 2011) and the exploration of new ways of describing digital properties (Sundström & Höök 2010)

With such an understanding of digital material we can now continue Gibson's idea of affordances into the case of Photoshop. Although theoretically sound, its practical effect still needs elaboration. Murray has already done some fundamental work as she reconsiders affordances in the digital realm. With a proper understanding of computers as complex objects, being not merely material or phenomenal, she has pointed out four basic affordances: encyclopedic, spatial, participatory, and procedural (Murray 1998).

The first on this list concerns the fact that a computer affords data collecting and storing. Many of Murray's examples elaborate on the way this is done by digital artifacts. Encyclopedic affordances then predominantly have to do with design principles rather than with affordances. The spatial affordance shows that the computer affords navigating. This is not to confuse with movement as mentioned above. Instead of three dimensional and relative to the animal, movement appears on a two dimensional screen, always navigating through data. As a participatory medium the computer affords interaction. While a vertical plane of glass affords breaking, a computer screen affords participation as it invites to interact with the world 'behind' it.[6] Murray is talking mainly about design principles reinforcing this property of the digital. But participation is also iterated as an element inherent to any affordance. For without the actual encounter between object and interactor, no affordance shall exist. Perhaps most characteristic of computing technology in general is the procedural aspect. It establishes the computer as affording the rearrangement of bits in any

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[6] Horizontal screens are becoming increasingly popular today as Ipads and other tablet computers sell to a wide public. These screens are more flexible, allowing horizontal and vertical communication. Their participatory affordances are different from the screens discussed here. Most importantly they afford tangible manipulation by inplementing touch-screen technology. Although Adobe recently released a Photoshop-like application for the Ipad, in a discussion of Photoshop, it suffices to discuss vertical screens.

constellation. The computer is able to "represent and execute conditional behaviors." (Murray 2011: 53) It does so by processes of abstract behaviors or *algorithms*.

Photoshop as a platform

With a firm understanding of affordances we are almost ready to identify them in Adobe's Photoshop. We understand the position of affordances in the field of HCI, but what position can be attributed to Photoshop? Being a software application, its position in the digital medium can be compared with what Gibson calls a detached object. Like detached objects it can be relocated in the larger system. The GUI then functions as its surface. Regarding affordances to be in service of the user, Norman would describe the application as a tool. And often they afford, like tools, the creation of a certain effect within the environment.[7]

Both metaphors of detached object and tool however are too narrowly defined to accurately describe the complexities involved in working with Photoshop. I will therefore suggest and illustrate that Photoshop, when in use, is a platform. A term, which is used by Murray to describe a collection of, standardized formats (inscription and transmission conventions). It includes combinations of hardware and software that function within certain social and economical context. (Murray 2011: 32-34) As such the figure of the platform can be explained as a metaphor rooted in the material assemblage of which van den Boomen speaks (2009).

Within platforms then several media converge, very much so as a surface in Gibson combines two media. In this sense, a platform is an interface. A platform however is even more extensive. It does not only combine a digital and an analogue medium, but it is always in relation to non-technological (conveniently called social-) factors.

Distinguishing affordances within a platform then is not easily done. It combines the immaterial complications of a virtual environment with a multimedial complexity. We do know however that it is the material relative to a generic interactor that we should search for when looking for affordances. Additionally when describing them we should keep away from interpretation and focus on observations. We thus search for material assemblies that are not yet actualized. Hence the very act of meaning creation within Photoshop is a matter I will attend in a later chapter, only after the more fundamental properties are considered. The multiple facets of the platform, which will be actualized, should however still be regarded, even on this fundamental level. It is from this premise that I start the following analysis.

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[7] Thinking of detached objects as tools is reinforced through the design conventions at hand in the digital realm. Nearly all applications make use of a window-bar which compares to a handle.

Chapter II – Affordances of a platform

To find these facets then we do need to look at the moments of working with Photoshop. One should however not (yet) regard the qualitative matter of meaning production, but rather the aspect prior to that: merely registering the actors apparent in "working with-". As this moment can only be met in actual encounters with the software, I have conducted a series of interviews with art students and both professionally employed graphic designers and photographers. Transcripts of the interviews can be found in the appendix. The results will prove useful as guidance for the analyses below. I will draw on them for support of my arguments. The present data is the only quantitative result that I have derived from them. Cross-referenced the interviews I identified the shared actors that are in any way related to the use of Photoshop. (Appendix I) The most frequently encountered actors (those that occur in more than two thirds of the cases) are discussed below.

Software

First I consider the actors described as software: In Gibson's terms these are the *substances* of the virtual environment. As they can be moved around in their environment they specifically account as *detached objects*. They can be moved across a computer, deleted, (re)installed, and even between computers (e.g. per CD-ROM) "Detached objects must be comparable in size to the animal under consideration if they are to afford behavior" (Gibson 1979: 133) In the case of software they also have to be relative to the medium. Not only does the user need to be able to perform physical actions such as clicking and dragging a file. More fundamental is the *compatibility* with the medium. A Windows application can typically not run on a Macintosh computer and vice versa. That different affordances apply between these operating systems (OS) is exemplified in the short documentary annex promo made on the development team involved in creating CS5. Here the team gives a small insight in the hassle involved in rewriting Photoshop in a new programming framework. A different OS being the most extreme form of such a framework. (Adobe Inc. 2011)

Most widely used under Photoshop users, the Macintosh OS has, through the 28 years of its existence, had a consistency in both its looks and underlying structure. With the release of the Macintosh II in 1987, Apple started to document the guidelines used to develop the system. The company did so in order to inspire application developers to work on the same premises as set out in the OS. Still available through their website, the updated *OSX Human Interface Guidelines* has increased in specifications but remains stable in its core. Important terms in the publication are metaphors, mental models, direct manipulation, feedback, consistency, forgiveness, and WYSIWYG (What You See Is What You Get). (Apple Inc. 2012) These are however not affordances but design principles. As I will argue below, design principles are strategies to

communicate affordances. The latter then can often only be read in between the lines of this document. Doing so we conclude that the Macintosh operating system affords: operations regardless of the laws of physics (hence our need for metaphors), representation through metaphorical objects and processes (simulating a direct interaction through visible feedback and the WYSIWYG strategy), learnability (communicated through consistency and clarity) and reversibility (implemented through a strategy of forgiveness).

Photoshop functions within the digital environment of the OS. Its development was initiated on the Macintosh system and accedes many of the design principles mentioned. As such, some affordances are equally adopted. Like any other instance of software, Photoshop too affords operations regardless of the laws of physics. Its affordance to represent processes and data through metaphors is similar to the same affordance in the Macintosh OS. Its implementation is comparable but different (describing this implementation is a matter that belongs to the path of design principles) Reversibility too is an affordance found in nearly all digital artifacts. In Photoshop it is famously adopted through the introduction of the "History function", which similarly communicates reversibility through processes of forgiveness. What makes Photoshop different is that all of these affordances are specified. Not only to the extent that we speak of design principles, but in a sense that they essentially, within their material, relate differently to surrounding actors. In the case of Photoshop the software on the most essential plane, invites the manipulation of pixels within image files. This is what Murray calls a procedural affordance. The different processes available can be described using the technical term of algorithms. Algorithms are constellations of code that solve specific 'problems' through procedural calculations. It is in these codes that procedural affordances may be located. Affordances are (part of) the 'solutions' evoked by them.

Algorithms should not be confused with tools available in the software. Moreover this is exactly the important difference between affordances and design principles. The algorithm, laying out the 'basic' environmental properties, functions as an actor of affordance. A tool on the other hand is only a tool when designed or actualized and as such makes use of design principles. I will extend on the difference between affordances and design principles at the beginning of the next chapter.

Although clearly considered with the fundamental properties of software, algorithms too are still designed. To exactly specify the reach of an affordance then, one must analyze the specific code as part of the software and determine the minimum of lines needed to give a solution. This investigation however will remain a theoretical one, and not only because Adobe will not publish its source-code. Moreover, these so-called solutions will differ depending on the task at

hand. As such affordances are, especially in a creative platform like Photoshop, highly complex and not necessarily deterministic.

Drawing on different affordances, Adobe has by now produced dozens of applications. Many of which are bundled in the software package *Creative Suite* (CS) which has reached its sixth installment. From this selection the interview data identifies Illustrator and InDesign to be the most used in combination with Photoshop. The first is a more technical image editing application based on the affordance of image manipulation through vector technology. InDesign affords the manipulation of image data related to print. These applications may offer affordances similar to those found elsewhere in the digital environment. However, like Photoshop, they each afford different 'solutions' to their users.

Hardware

Although this discussion starts with software, we cannot simply ignore the relations that go from software to other actors. The interviews show that when focusing on the working practice surrounding Photoshop both hardware and interaction among users themselves should be regarded. Within them too, affordances can be identified. These then are characterized differently and are not as often understood to be procedural.

Like software, computer related hardware consists first of all of detached objects in the physical world. They can be lifted and repositioned. This affordance of movability shows essential also in relation to the creative process. Regardless of their work field, most interviewees explain to highly value mobility. Laptops and pen-tablets are common among Photoshop users.

Similar to a mouse or trackpad, a pen-tablet affords navigation in the virtual environment through action in the physical world. Its radically different design however affords utilizing a unique hand-device relationship. When designed according to the right principles, the pen-tablet allows for more precision and faster manipulation compared to other input devices. Several interviewees describe a practice in which the mouse, standard in most computer use, has completely been replaced. Others have adopted a practice in which both instruments are used complementary.

The keyboard affords a different kind of navigation. One that is reinforced by its wide range of buttons. Important in relation to Photoshop is the affordance to combine actions by pressing multiple buttons at once. Many designers and trained computer users increase their efficiency by building on this affordance. Like the Macintosh OS, the Photoshop software supports this particular keyboard use.

The screen regardless of its mobile affordances, affords two-dimensional representation. Throughout the historical development of the digital screen, a

desire to represent three-dimensional spaces can be distinguished. Such sentiment is still very much evident in the development of videogames but a leveled form is also visible in the representations found in GUIs. Present interface metaphors seem to have reached a consensus between this tendency towards three-dimensionality and the realization that simulating three dimensions on a two-dimensional device hardly contributes to the effectiveness of digital affordances. As we will elaborate on the visual communication of affordances in chapter IV, it will here suffice to acknowledge that the computer screen indeed affords two- and three-dimensional representation.

Human

Affordances between humans are, as Gibson has noted among the richest and most elaborate. They are more often than not *mutual affordances*. "Behavior affords behavior, and the whole subject matter of psychology and of the social sciences can be thought of as an elaboration of this basic fact. " (Gibson 1979: 135) These scientific fields are not the prime concern in the present research, nor am I specialized in them. Still, a psychological approach to digital affordances might be interesting in addition to a research into the impact of affordances on the products created by Photoshop.

Therefore I will here only briefly point at the different subject positions in human interaction, as found through the interviews. Again I only present those that are related to Photoshop and as such may be considered part of the platform on which working with Photoshop is *afforded.*

Although all interviews include only 'one man businesses', several instances of human interaction still witness the negotiating of affordances. Considering the user end of the software, these instances however all have to do with the actualization of affordances within Photoshop and other non-human actors. Collaborative partners will debate about how to use which tool. Clients' desires are almost always important in the eventual practice of creation. Co-workers are perhaps the most important group in shaping behavior towards Photoshop. They prove fertile ground for sharing information on the topic. They are however usually not directly influencing the affordances encountered in the software. Gaining information is not constituting the affordances but shaping their use. For literacy is a process of an individual mind, whereas affordances compare to a general relativity.

The analysis of affordances in this chapter only begins to describe the full scope of complex relations associated with affordances in software. For starters, the inclusion of actors outside of the actual software may be extended on. I propose the categories of human and hardware actors as a start to such an inquiry. Furthermore the current emphasis on procedural affordances is due to the nature of Photoshop. When other instances of software are explored, another

affordances may dominate. In order to understand even this concise description of affordances we should extend the analyses to include other, related instances. Predominantly, the reoccurring idea of principles in design deserves further explanation.

Chapter III – Design principles

When affordances are collected, ordered and shaped they are designed. As developers design the affordances of basic material they are coping with ideas that move away from the fundamental plane of affordances. Choices made in a development process are based on principles of design: knowledge about the effect of specific modifications. Design principles have their impact on the communication of affordances. Sometimes they obscure them, leaving the impression that there is no affordance at play. But affordances may equally be emphasized in design. In these cases design is easily misunderstood as an affordance. It is because of this close relation between the two paths that I incorporate design principles in the analyses of Photoshop. Exemplifying their different position will hopefully prevent confusion in further research into agency and affordances in creative software platforms.

There are of course many design principles. William Lidwell, Kritina Holden and Jill Butler have described over a hundred of them in their influential handbook *Universal Principles of design* (2010). Some of these however are more general than others and as such can be applied on most instances of design. The balancing of agency between user control and automation within the artifact is one of these broad principles. Yet, in the present context of affordances in the platform of Photoshop this balance is an important one. For affordances inherently relate to a specific distribution of agency.

Another design principles closely related to affordances and in turn, to the balance between control and automation, is found through Murray. Describing the qualities of 'good tools' Murray calls on transparency, efficiency, and learnability. These design issues, when perceived with the broad scope borrowed from the control-automation balance, come down to a distinct balancing of another much-discussed issue in general design: the flexibility-usability tradeoff. Both principles are largely inspired on Norman's writings. Lidwell, Holden and Butler explain the tradeoff: Experienced users expect more and more sophisticated features, but this results in decrease of usability. Alternately, designing artifacts with limited complexity reduces flexibility. This balance is related to the matter of control and automation in that it precedes that issue. Flexibility affects the amount of control a system affords. In addition, less flexible systems are often highly automated.

The implementation of these ideas in turn has its effect on the design and affordances actualized by an interaction with Photoshop. Tracing the connections between design and practice, several moments concerning specific control-automation balancing qualify as actors in the network of image construction. Therefore design principles will prove useful in further research to the impact of software on image culture. In the following I will discuss some of

these moments and relate them to affordances in order to exemplify their different paths.

Control – Automation

A rather literal application of the control-automation balance is found on many encounters with Photoshop. In several option windows the user can choose to either use the specific *controllers* or press the *Auto* button to let the software calculate the adjustments. The latter option adjusts the pixels of an image based on the calculations of predetermined algorithm. This automation turns a matter of human assessment (deciding on the amount of light and color values) into a procedural equation. As this some choice is offered at many instances within the software, it becomes clear that this design principle relates to different affordances at the same time.

Another example of automation is found in the many presets available in Photoshop. Presets are sets of standard settings that come within the software and are therefore similarly available to all users of a specific software version. The specific variables of which presets consist can be changed at any moment, but the settings may equally be restored to their default status. Indeed the default algorithm in the level or curves "Auto" button is pre-set. And like the Auto button, presets afford the use of a function or tool with pre-determined settings. Presets however afford more control than selecting a still predefined algorithm does. Editing software like Photoshop – whether it focuses on images, sound or movies – often makes use of presets. The readily available color swatches, styles, or any selected filter all have their settings pre-set. Offering a standard set of settings is an easy way of showing what effects can be reached with a function's parameters. Serving as an introduction to a function, presets are often easily accessible.

Figure 1
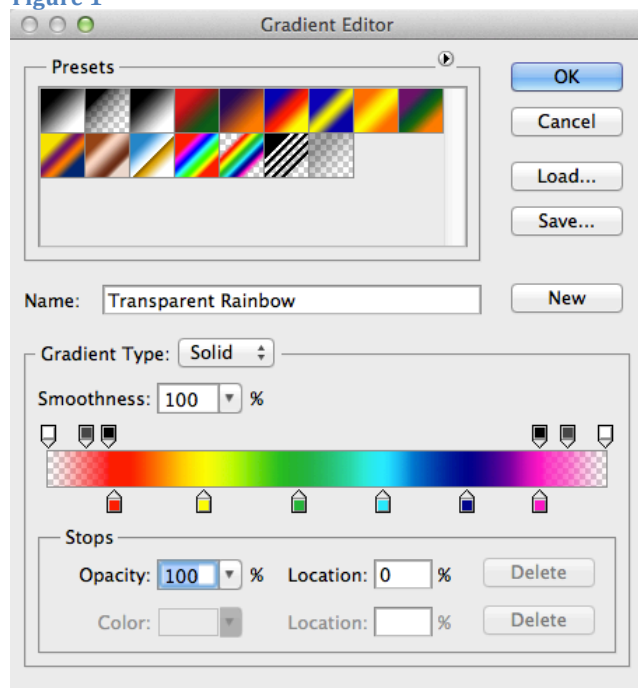
Consider the available presets of Photoshop's gradient tool. The same 15 presets have been available practically unchanged for the last seven full releases. When a user clicks on the selected preset, the gradients dialogue box pops up (Fig. 1). Here additional changes can be made. It is tempting to describe this dialogue as the place to create a gradient from scratch. This is however, strictly speaking,

impossible. Indeed a 'New' preset can be made. But even these are not completely new. Instead of creating a truly clean set of variables, the preset that was last selected, is copied allowing changes based on that preset. We can thus say that the gradient tool works only from (highly configurable) presets.
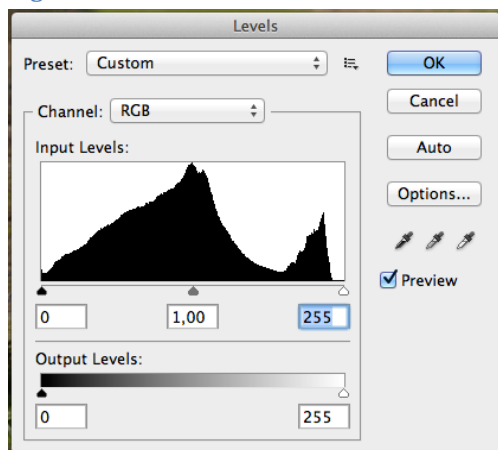
To think that adding variables is a way to circumvent the automation that results from presets is however false. Adding controls can lead to obscurity because of their number visually cluttering the interface (this relates to the flexibility-usability trade-off addressed hereafter) or because of their mutual 'logic'. As the number of controls increases, so does the complexity of their relations. Again the affordances of design are negotiated between user and artifact. Changing particular preset settings to one's likes often requires a trained eye and a fair amount of literacy. This is due to the design of the function. Basic principles like the mapping of variables and the amount of feedback are employed to facilitate the communication of affordances. While feedback is a familiar design element already found with the machinery in the industrial age, mappings are a more recent concept. The importance of mappings for good design stems, again, from Norman. In *The Design of Everyday Life* he introduces the concept as one of four principles for good design. Even when not agreeing on his definition of "good design" the concept of mappings proves essential in HCI. When compared to affordances it describes a relation actualized by the artifact. Where affordances include the human understanding of the artifact, mappings are essentially concerned with the relation between interface aspects and their respective function in the system – as defined in the design model. Thereby they support (or contrast) the original affordance of the function they relate to.

Figure 2

Review the controls of the gradient tool. (Fig. 1) The mappings are communicated more clearly than those of the levels or curves (Fig. 2, 3). The latter both require a high level of logical reasoning as the variables are positioned in relation to the histogram. Setting their variables requires the consideration of the input
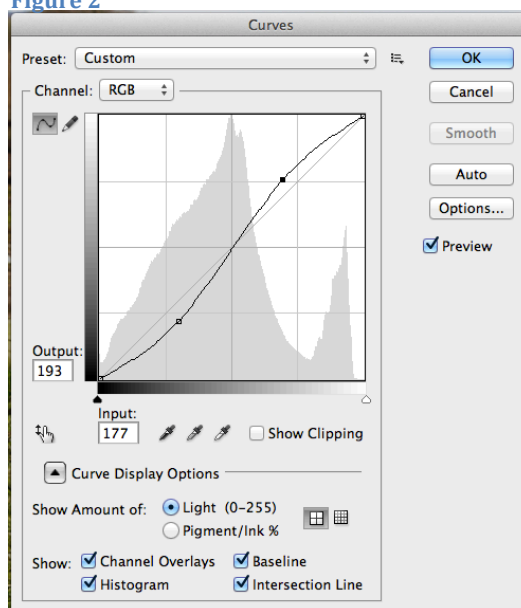
and output values of the adjustments that are about to be made. Conversely, the gradient variables are defined by dragging either a color or opacity to the desired location on a direct representation of the gradient. This mapping has a nearly one-to-one kind of relationship with the eventual effect on the image. This is what Norman calls 'natural mapping'. Indeed he argues that a natural mapping relieves the cognitive load or in this case "memory burden". (Norman 2002: 75) Instead of memorizing the relation between the x and y axis in the curves dialogue, the gradient options communicate their functionality directly. Research in the field of human cognition proves this decreased 'burden' to be beneficial in efficiency. (Sweller 2009) As Norman shows that mappings are of primary influence on the cognitive load, we may conclude that automation which is designed after "natural mapping" facilitates efficiency but simultaneously induces standardization. Indeed this design principle alludes to a user's sense of what is 'natural'. When settings are already in place, the mapping may be too natural in the sense that the separate variables do no longer interest the user. Mappings then distract potential attention from alternative options and settings.

Flexibility – Usability

The second balance famous among developers is that between flexibility and usability. These concepts relate in such a way that the principle associated with them is in fact a tradeoff. Increased flexibility of an artifact results in a decrease of usability. This design axiom has been the starting point of reasoning for many designs, both on screen and thereof. It most clearly applies when considering traditional tools. Lidwell et al. explain:

> "For example, a Swiss Army Knife has many attached tools that increase its flexibility. These tools taken together are less usable and efficient than corresponding individual tools that are more specialized but provide a flexibility of use not available from any single tool." (Lidwell et al. 2010: 102)

Like the balancing of control and automation, this tradeoff too has its origins in the design philosophy found in Norman. He argues that a proper balance is met when the number of controls matches the number of functions. Discussing the tradeoff in practice, Norman argues for increased flexibility over usability. To the fact that with increased flexibility, the interface will look hard to control, he coins a single solution. He proposes to hide the controls that are not in use. (Norman 2002: 209) This premise is found at the base of many interface designs including that of Photoshop. Leaning on the menu conventions as established by Apple, the menu bar – the most natural way to hide items in a digital interface – is home to most of the software's functionality. This structuring method hides items through the use of hierarchical drop-down menus. We notice that this design principle also is related to the availability of functions.

Tracing Norman's argument the analogy with Photoshop continues. Adobe too tries to match the number of controls with the number of functions expected by users. When the users are as varied as is the case of Photoshop, this design principle tells Adobe to design a flexible system in which artists, photographers, illustrators and web designers alike can fulfill their creative needs. All of which require their individual functions. Photoshop's current strategy follows this advice. Senior solution consultant Ton Frederiks says about this: "...we try to give all the groups that we have gathered over the years an equal amount of new features. " (Interview Ton Frederiks)

But things are not as simple as Norman's solution makes it seem, to speak with his own words: "simple things can be complex". The constantly evolving set of features poses the problem of keeping the great flexibility manageable for the user. Hiding controls in order to make the tool seem easy is one possibility of several ways of dealing with this problem. What Norman however doesn't address is that with any such solution come many implications for the interface design, the visibility of affordances and for the practice of working with the interface.

Murray describes those implications in three affordances of "good tools". These include efficiency, learnability and transparency. (Murray 2011: 302) She points out that the number of commands presented by an interface has its impact on user behavior:

> "The […] explosion of command choices makes games, virtual environments , and professional tools hard to learn and confusing to use. […] The proliferation of icons and menus can paralyze the user with too many choices, destroying transparency by focusing attention on the control panel instead of the task at hand..." (Murray 2011: 330)

In order to communicate affordances clearly then, we need a carefully designed balance of usability and flexibility.

Command structure

Photoshop in effect applies a number of strategies to structure items, functions, tools and options. These commands are embedded in interface conventions. Photoshop draws on a fair amount of those. The top of the screen displays a menu bar as introduced in Apple's 1983 *Lisa* interface. (Perkins et al. 1997) Today it can be found in almost any desktop computer application. By far most functions apart from tools are organized here. The items are divided among umbrella terms and structured hierarchically. Many items in the menu open up in a dialogue box where their parameters can be controlled. Another convention, perhaps most characteristic for Photoshop, is the toolbox. Unsurprisingly this is home to all 'tools' available in the application. Soon enough (version 4.0) the toolbox got crowded and like functions were stacked under one button. Selecting

a certain tool influences the context menu as pops up when clicking the secondary (right) mouse button. This way many commands also found in the top menu can be selected. Thereby offering yet another way of finding commands. Functions that are often used and require adjustment of multiple variables with easy access – first brushes (version 2.5) and later color, layers, history etc – got their separate panels stacked on the right side of the screen. Another new way of offering commands to the user was implemented in 2000 with version 6.0. A 'ribbon' or 'options bar' popularized by text processors was introduced. It allowed some functionality that crowded other structures to migrate to the top of the screen. A version later, the ribbon was extended by including tabs to open panels. The panels themselves already had tabs within them resulting in an even more hierarchical order of sub-tabs. As these tabs increased in number, their relation to the in-panel tabs became harder to distinguish. Consequently the tabs to open panels were quickly redesigned making them look distinct from the tabs within panels. In 2008 CS4 introduced the short-lived 'application bar' to the Photoshop interface. It was used to harbor a set of 'meta' functions that applied to the image representation within the interface (i.e. 'arrange documents', 'screen mode', zoom and extras) But more importantly it foregrounded the previously rather obscured option to customize workspaces. This is an option that allows each user to customize their interface by selecting a number of panels and menu items they want to be available in their workspace. Several workspaces are available as presets. In Adobe's latest release the application bar is discontinued but the workspaces are still easily accessed from within the options bar.[8]

Within this single application then, a number of at least six different command structures are applied simultaneously. All are structures that have proven beneficial one way or another. They are likely to remind each user to a previous software experience whereupon they can draw for information on how to use those. Therefore they often go unnoticed. So when implemented 'correctly', i.e. when flexibility and usability are balanced, these structures are adding to a transparent experience. But what factors decide when the balance is right? This becomes clear in the disruptive moments when attention is drawn to the interface itself when this shouldn't be the case. Heidegger in his tool analyses calls an artifact in this moment, present-at-hand. (Sein und Zeit 1927) Traditionally it is the moment when a tool breaks that it opens up for new interpretations.[9] Regarding the GUI design principles these moments present

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[8] For an extended overview and comparison of different GUI aspects in Photoshop versions 1.0 to CS2 the website guidebookgallery.org (2005) provides an insightfull resource.
[9] The importance of the broken artifact in transforming meaning is repeated in the vernacular of ANT. Latour uses the example of a broken computer to signify the artifact as mediator. (Latour 2005: 39) A role central to ANT as it includes actors and their significant movement within a network of meaning production. Mediators are distinct from intermediaries whose function is transportation without transformation.

themselves when the organizational structures described above desperately try to cope with the amount of controls. [10] The balance is disturbed and leans disproportional towards flexibility. In Photoshop this starts with the multitude of organizational structures. All the tabs, windows, tools, and panels visible even upon a clean start-up might well overwhelm novice users. Even trained users mention that the finding the right function "…is always a bit of a search." (Interview KM) Another moment of improper balance can be imagined as commands clutter the screen. Leaving relatively little room for the actual working image. This again draws attention to the controls instead of the task. This specific problem is clearly pointed out in one of the interviews:

> *"What irritates me about the interface is that you can't easily open several 'Panel' tabs at once. When clicking one, the other one closes. So you'll have to drag these windows out of the panel in order to simultaneously view them. This way the interface gets messy and you'll have to 'clean up' again. "* (Interview SW)

Murray, in a discussion of the application also points out this rather chaotic tendency in the specific case of Photoshop and concludes: "Clearly, the control panel is out of control" (Murray 2011: 330) She however does not distinguish the separated moments inducing the imbalanced interface. She combines discerns of using too many structures at once and the cluttering of the screen. Not only are those separate issues – of which the second is not as prominent in Photoshop as in many other applications (e.g. Microsoft Word) – Photoshop also displays a third moment of friction. This is encountered when going through menu after menu and tab after tab in order to find the desired command. This requires extended navigation, thereby increasing the kinematic load of the task. It slows down users making them annoyingly aware of all the submenus they have to go through.

The common point in all three moments is the hierarchical use of structures. McGrenere & Ho note that "… affordances exist (or are nested) in a hierarchy." (McGrenere & Ho 2000: 7) In this instance where high flexibility needs to be guaranteed (Cf. Ton Frederiks statement on hardly ever taking out functionality), hierarchical structures however tend to be insufficient. Designs like this face the danger of disturbing the balance by overloading the structure with too many commands. When a great quantity of commands and functions are prioritized, as is the case with Photoshop, other (uses of) structures should be considered in order to reinstall the balance. The quick overview of the evolution of the interface above shows that measures are recurrently taken. And Ton Frederiks confirms that "this is a continual balancing" (Interview Ton Frederiks) The same analyses also supposes that this is an increasingly difficult struggle for the

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[10] The experience of an artifact as being present-at-hand may additionally be induced by (a lack of) metaphors. This is discussed in Chapter V.

Photoshop team. Structures are tested and removed after a few versions (e.g. the application bar) and the concern rises that additional structures cannot be endlessly implemented.

Structures are of course necessary in order to organize commands within software. But what are the options when hierarchical structures – functional in some cases – fail? Many frequent users of the Adobe applications turn to the use of keyboard shortcuts. These however are based not on visibility but on memory. This fact implies other problems of usability and even health issues as the interviews report a case of threatening RSI (Interview AJ).[11] Moreover, keyboard shortcuts are a structure that may be used parallel to the visually based ones under consideration here. As visual representation continues to be the most important way of operating software, we need a structure of organizing commands that copes with extensive flexibility without giving in on usability. Whether such a balance exists in the case of Photoshop may seem debatable. Present structures fail to do so and the question rises whether human memory can at all cope with the hundreds of options and functions in Photoshop.

Recently, a collaborative research of computer scientists from Canada and New Zealand addressed the issue of balancing visible command structures and poses a promising solution. Focusing on a way to select from a large amount of commands most efficiently they propose the use of a 'Commandmap' structure. Commandmaps "...provide multiple stacked Ribbons that are concurrently displayed when the user presses a dedicated mouse button or command key." (Scarr et al. 2012: 260) Selections are made by clicking an icon and the overlaid structure is opaque so that the workspace is continuously visible. Their main argument is based on the psychological concept of spatial memory. Functions are located by drawing on the users memory of where the icon was before. The researchers explain how the use of a single consistent structure can improve usability by responding to theories of object location memory. (Scarr et al. 2012: 258) Other research (Jones & Dumais 1986) shows that spatial memory works best when combined with a representational structure. Based on this premise the researchers chose a ribbon representation. As such they take best of both (hierarchical and non-hierarchical) worlds.

Advantages of the structure are many and either limit or circumvent all friction moments that turn the Photoshop interface present-at-hand. Unifying commands in one model then limits the eclectic use of structures and therefore the risk to confuse the user. The interface is cluttered only when the Commandmap is called

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[11] Concerning usability problems: some interviewees that often make use of keyboard shortcuts point at the confusion such an invisible structure may lead to. "At times it appears I pressed unknown keyboard shortcuts and I accidentally activate some 3D function. [...] I don't understand anything about those functions yet." (Interview IV)

on. An action that is only carried out on order of the user.[12] Additionally the navigation speed for expert users increases up to 34% for expert users (while novice user's speed remains equal). Their approach holds the additional benefit of a high level of the affordance of learnability. One can therefore assume a faster transition from novice to expert. Most importantly the Commandmap interface contrasts the deep hierarchical aspect on which many other structures rely. Behavioral research shows that (expert) performance benefits from less hierarchical organization. (Cockburn & Gutwin 2009) The minimal structure design of the Commandmap interface does not necessitate developers to determine (sometimes arbitrary) hierarchies in structuring items to generate usability (e.g. the menu bar). A practice that, as I have hinted at, increases standardization by foregrounding specific functions. Instead the idea of spatial memory affords an interaction in which the user encounters an equally reduced amount of cognitive and kinematic resistance. This opposes the present model in which designed hierarchies – as a side effect to usability – persuade to choose the most readily available functions. Instead the Commanmap interface defies the usual relationship between flexibility and usability. Instead of being a fixed tradeoff, the new structure allows for both a flexible and usable communication of affordances.

Designed software structures, as effectively present in Photoshop are the bases through which affordances are communicated. While their design is balanced according to many principles, general conclusions about their impact on communications may be drawn rather easily. Conclusions that may lead innovative scientists to propose new solutions to existing problems in HCI design. As the Commandmap example illustrates, such efforts can be important in both practice and theory. Not only do they allow for the affordances to be more effectively communicated. They also illustrate that design principles are not fixed rules that have to be obeyed.

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[12] The researchers do acknowledge the downside of limited visibility when the Commandmap is opened. They suppose that the benefits outweigh this risk. (Scarr et al. 2012: 265)

Chapter IV – Interface metaphors

Until now we have analyzed affordances and design principles. Concepts that concern the processes found in digital artifacts. In the last chapter however we have increasingly noticed the influence of actors concerned with representation. Processes always have to be depicted in order to communicate with the user and subsequently interact with apparent actors. This indicates that as literature and science author N. Katherine Hayles has argued, the computer is not only a tool or system, but also a "symbol-processing machine". (Hayles 2002) A machine that produces code not only to communicate with other machines, but also to be meaningful to human interactors. This process is carried out by the onscreen representations, which today are standardized GUI. These GUI in turn rely completely on metaphors and their accompanying conventions. Like design principles, interface metaphors communicate affordances. Yet their nature is different from that of design principles. For metaphors may equally refer to these designed aspects in software.

Whilst explicitly active in relating system code and meaning, metaphors often seem more related to the latter. With them it is always the interpretation that comes first. If the formerly reviewed design principles where already more practical than affordances, metaphors are even more 'superficial' as their starting point is representation (as opposed to essential stance of affordances). Hence, we distinguish them on a third major path of actors in the network surrounding Photoshop. Yet, like affordances and design principles, the path consisting of metaphors, is highly connected to other (collected) actors.

As such metaphors can be hard to distinguish from affordances. At times they appear to embody the natural potential of affordances – an issue illustrated by the example included in van den Boomen's discussion about software metaphors (2009: 255). And often they are taken to replace principles in design. Although connected to those aspects, they are primarily considered with the representational aspects. They are in fact a way of communicating design principles and affordances and as such concerned with the medium of messages.

As we know from McLuhan that "the medium is the message", we are right to assume that there is more to them. (McLuhan 1964) Metaphors not only communicate, but indeed construct meaning. The power that metaphors may exercise is described by Lakoff & Johnson:

> "...metaphors may create realities for us, especially social realities. A metaphor may thus be a guide for future action. Such actions will, of course, fit the metaphor. This will, in turn, reinforce the power of the metaphor to make experience coherent. In this sense metaphors can be self-fulfilling prophecies." (Lakoff & Johnson 1980: 156)

The authors explain that a metaphorical concept will channel the observer's focus to certain meanings while distancing it from others. Focusing on this active role metaphors perform, the authors' description leads to an understanding of metaphors as actors. Influencing the social reality surrounding them and their own position. Writing about the semantics of GUIs van den Boomen, in a similar fashion, shows that steering communication in this way is inherent to these actors: "Metaphorical sign-tools acquire a life of their own, cannibalizing everything else that might be there. By showing they hide, by translating they substitute. " (Van den Boomen 2009: 254) By hiding functions and steering users metaphors indeed regulate and standardize the digital potential. To fully describe the implications of a platform like Photoshop then, we must incorporate metaphors in the observation.

Conventional metaphors

Especially when discussing digital artifacts metaphors seem increasingly pre-determined. Design principles often have a set of corresponding metaphors that can only sparsely be deviated from. Consider for example the collected design principles as used by Apple. Since the first version of the Macintosh OSX these go by the name of 'Aqua'. With regard to the different UI elements of OSX, the developers at Apple advocate a "correct use" corresponding to three ground rules: "Don't assign new behaviors to built-in UI elements. [...]In general, don't create a custom UI element to replicate the behavior of a built-in element. [...]If you really need a new behavior, design a new element for it." (Apple Inc. 2012: 48) besides design principles metaphors heavily rely on mental models. Again Apple presents a telling example as it warns developers to "Be aware of the model's inherent metaphors, which represent conceptual components of the task." Following this ground rule a standardized collection of metaphors is institutionalized. And as it grows, contesting it with other images becomes increasingly difficult.

Normally the connections that account for this limited visual language are hidden. Their appearance is part of the language of digital images that appears to be natural to the user's eye. The fact then that they are laid bare only in a developer's document is telling. It is because at the state of development, the artifact is still incomplete. It cannot yet function according to its affordances and intensions. When an artifact is finished the collected affordances, and design principles are dressed with metaphors and the communication between artifact and user turns into a 'black box'.
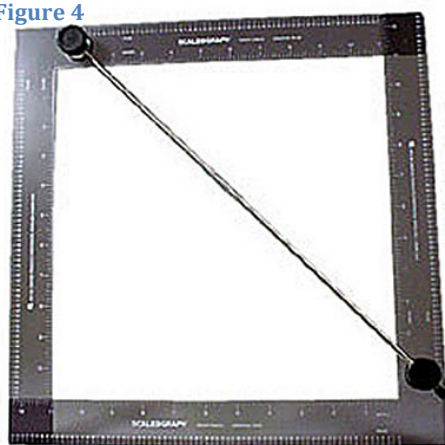
There are however also moments in an artifacts life (its state of actualization and interaction with the user) at which connections become visible again. These are the specific moments in which the artifact does not function according to its

collected affordances and design principles. It is at these unguarded moments that conventions (in this case metaphors, but the same process can be distinguished in the analyses of design principles discussed above) may be re-evaluated. In the volatile world of the digital, disruptions may occur with many causes. An interaction between a specialized application and non-expert users might result in the questioning of the metaphor. The same goes for examples where a developer changes the metaphor – when the user's model is inconsistent with the designer's. This is why companies like Apple and Adobe only scarcely implement visual changes. The disruptive moment may even be a result of missing metaphors. This is typically experienced as a lack of feedback. In any case, these moments are noticed only when working with the artifact. It is therefore that research into the impact of software metaphors should include a sample of actual working encounters. In order to do so we need to look inside the black box over and over, every time we encounter a new artifact.

The artist's metaphors

Taking this metaphor discussion into account it seems that digital metaphors are always almost aggressively pro-active in their communication of meaning. Users rely on them and therefore metaphorical representations are attributed much power. To an extent this may be leveled by literacy. Many of the metaphor icons in Photoshop for example have a symbolic relation to real-life tools. Choosing a picture of a brush as metaphor for (algorithms at work when using) the brush-tool is easily understood as a natural relation.[13] As long as their procedural meaning fits that of their analogue counterpart, the metaphor succeeds in a credible communication. The brush tool affords adding color to a plane in a stroking fashion. Anyone who has ever held a brush will agree with the figure of the brush even though pigment is replaced for pixels.

Figure 4

When a specialized tool like a cropping ruler is chosen as a figure, the relation between actors starts to shift. (Fig. 4) Although print professionals may remember using the rulers to preview a crop on the drawing board, most of today's users will not be familiar with this image. They know the image through its iteration in the many Photoshop versions preceding the one in use. In these encounters the image has lost

[13] Adobe has copied many of its basic tool icons from the precedent application *MacPaint.* The pixel editing program that came with the first Macintosh computer in 1984. Relying on an already widespread visual language, Photoshop made use of conventions from its first version on.

its symbolic meaning. The power of meaning production lays predominantly with the software. As user expectations are solely based on former experiences considering the tool, the metaphor (now simply a sign) is a self-fulfilling prophecy just as Lakoff & Johnson argued. It constitutes its own reality.

Still the reality they exercise is a 'natural' one. In the example of the brush metaphor this is because of the symbolical reference of the sign.[14] Here it is the digital convention that accounts for credibility and a *ready-to-hand* artifact.[15]

Other metaphors however are less natural as they don't rely on either symbolic reference and cannot (yet) find sustainable support in conventions. A recent and telling example of this is the name and metaphor at work in the *content-aware* function. A function that has provoked a glorifying enthusiasm among users and reviewers as it may be used to recompose images with reasonable results. Indeed a process which is typically thought to be only possible by extensive human effort. The metaphor of an aware companion capable of understanding the content in an image is reinforcing the awe-factor among users. It seduces users to understand Photoshop as a human-like actor which invests the software with fake agency.

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[14] These examples are primarily based symbolic signs. For an extended discussion on Piercian semiotics in digital interfaces, read van den Boomen (2009).

[15] After Heidegger, a *ready-to-hand* tool is a tool in accordance with its *Um zu*. Ready-to-hand therefore opposes the moment of present-at-hand discussed before.

Chapter V – Conclusion

The urgency of this discussion about affordances is a product of a concern about contemporary image culture. As more and more of the visual impulses are today either received or made on a digital screen, an investigation into the nature of the actors involved is pressing. I have proposed in the course of this discussion, that it is primarily through affordances that such an investigation is permitted.

In the above analysis I have tested my understanding of affordances to the practice of working with Photoshop. My assertion that the original context of the concept should be revaluated, is affirmed by the analogies that can be drawn between the natural and the digital environment. Upon testing the concept in practical encounters, the boundaries of the definition started to show and other concepts had to be included in the discussion. Most importantly the difference between affordances and aspects communicating and representing them had to be clarified. These are all too easily mixed up in both theoretical discussions and practical encounters with software. By asserting that affordances act at the very core of artifacts, I have proceeded to draw out different paths on which participating actors may be described. This effort not only serves future discussions in the theoretical field of HCI, but also may show important to practical research and development.

Indeed Norman notices the problem of the theoretically based design community not being involved in this development of digital applications. Instead programmers mostly have to make the design choices themselves. Norman disapproves: "Programmers should not be responsible for the computer's inter-action with the user; that is not their expertise, nor should it be." (Norman 2002: 178) He subsequently argues that the computer's full potential can only be realized when developers take the user into account. I do agree with this claim. But to achieve such a practice in design, the ideas surrounding affordances and above all, the concept itself, must distill into coherent definitions.

Additional discussion on the terminology addressed in this research then is necessary. The paths laid out here may serve as a theoretical platform on which connections between actors based in, and extending beyond software may be drawn.

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Appendix I – Cross referenced interview data

The information below involves the actors as typically used in the individual's working environment. Only actors connected – in any practical way – to Photoshop are considered. Actors that were explained as highly important are indicated with a bold "**I**". Multiple "I"s indicate the number of these actors when relevant. Green are students (S), yellow are photographers (P) and orange are graphic designers and illustrators (D). All individuals within these groups know each other. They are in most cases peers among which Photoshop and other design practices are discussed.

JB	IV	HK	RM	SW	LM	KM	DH	AJ	Actors
S	S	P	P	D	D	D	D	D	
									Software:
I	I	I		I	I	I	I	I	Mac
		I	I						Windows
I	I	I		I	I	I	I	**I**	Photoshop
			I						Plugins
I	I		I	I	I	I	I	I	Illustrator
I	**I**			I	I	**I**	**I**	I	InDesign
		I	I			I			Bridge
	I	I					I		Lightroom
				I		I			Acrobat Pro
	I								Dreamweaver
I				I					Any text processor
			I						Photomatix
		I							Any wireless camera import software
I	I			I	I	I	I	I	Tutorials found through any internet browser
									Hardware:
I		**I**	I	**I**					Desktop Computer
	I	I	I	I	I	I	I	I	Laptop
		II	**I**	I		I	I	I	External screen
	I	I	I	**I**	I		I	I	Extensive keyboard use*
I		I		I		**I**	I		Mouse
	I	I	**I**	**I**	**I**	**I**		**I**	Pen tool
	I	**I**	I	I			I		Camera
									Human:
I	I			I	I		I	**I**	Co-workers Big group (>3 frequent peers)

41
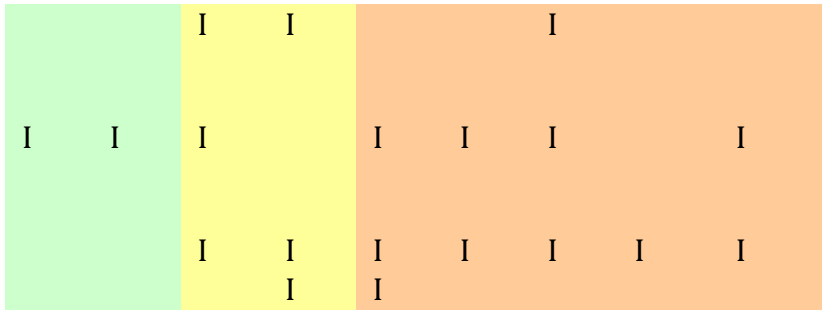
		I	I			I			Co-workers small group (<3 frequent peers)
I	I	I		I	I	I		I	Direct collaboration partners
		I	I	I	I	I	I	I	Clients
			I	I					Interns

* Use of the keyboard in which shortcuts other than cut/copy/past are used frequently.

Appendix II – Interview transcripts

20-06-2012 Ton Frederiks – Adobe Benelux

To introduce myself. I am Ton Frederiks and have been working at Adobe since 1990. I started working at Adobe to support Photoshop in Europe. Now the European headquarters is located somewhere else. So I have been working with Photoshop since version 0.something.

<u>Right, that was the year Photoshop became available right?</u>

Yes, it was commercially available in 1990. Before that, there is a lot of history, but you can read that in the official document that's out there. Anyway, I have seen the company develop from the very start.

As far as competitors at the time, there weren't many companies like Adobe. There were hardly any methods to get images into the computer. Or at least not for the commercial market. There were some expensive high-end scanners that could digitalize images. Those were only available for large "litho companies" that produced for magazines. Desktop scanners only became available in the late 1980's. Photoshop at first was bundled with one of those scanners (a dia scanner). The name at the time was "Barney scan". This was a temporal collaboration.

Other programs from that time -with the same goal as Photoshop- were few in number. One of them was called "Image Studio". Another one was called "Color Studio" both came out in 1989 and were developed by the same developers. These programs let the user digitalize and manipulate images. Color correction but also making photo-collages and combining images where among the first functionalities. These were all aimed at a single image. In contrast to the contemporary practice that can combine and process a big amount of images.

Competition was, well it was at the very beginning [of the image processing industry], and Adobe hoped to sell a couple of hundreds of copies. I myself worked with those other programs too. Before I came to Adobe, I have worked with "Letraset"; a European distributing company who represented all three applications. A bog advantage Photoshop had over those other two, was ease of use. Color Studio was far more complex to work with. Not that it was a bad piece of software –on the contrary, at the time it could do more different things- but it was harder to work with.

<u>So already in the very beginning Usability was an important keystone of Adobe?</u>

Exactly. We bought it [the software] at an early stage, but it took us an additional year to prepare it for the marked. This included polishing the UI and the Usability.

Besides usability, Adobe had a better marketing strategy. Bundling with scanners was one of the steps we took. As everyone who bought a scanner needed manipulation software anyways, the program was quickly wide-spread. Normally you had to buy on of such programs.

<u>Where there besides usability, any other key goals established during those first days?</u>

Well, if you look at target groups, the first versions were –since there were no digital cameras- more aimed at designers than at photographers. Later the photographers grew to a main target group of course. There were some photographers using our software in the beginning. But those were mainly the ones that already did special things with their photos in the dark room. So it was mainly the creative use of Photoshop that was important.

Photoshop appeals to a great many of target audiences. And at a certain moment we understood that the application is used in many different ways that we would have never imagined. We welcome for instance medical photographers and even police. Photoshop is also much used in the video production world. And that is also partly where the software comes from. Thomas Noll – the original creator of Photoshop- had a brother John Noll, who worked for "Industrial Light &

Magic" which is a company that still produces special effects for the movie industry. That company needed something to apply special effects on screen, which was one of the main goals of Photoshop.

From the first version of Photoshop, Russell Brown a colleague of mine did the "Adobe Inventational". Where artists were invited to work with Photoshop for a few days, in order to gain knowledge about how these people like to work with the software. And this is still done in several ways. We still do direct tests and look at how someone handles the program, which is valuable information for us. In addition to this, we placed a piece of software in every Adobe program that –when activated by a user agreement- collects data about what tools are used, what filters and menus are selected.

Is that the same information as obtained with activating the history log?

It is similar data but gained in a different way. This gives us information about what tool is used a lot and which is not used at all. Well and this information can mean something to us for the future. If a tool is never used then it is either a lousy tool, or it is overly complicated, stupefying the user.

Since there's no personal information in those logs, I can imagine it to be hard to read that data appropriately.

We do indeed need many other user researches.

We also do trade-shows where we have a lot of contact with the users. We also have an extensive beta-testing program. And that starts with a small group that is very, very much involved in the early stages of a new version. There's a bigger group that is later involved. Those individuals give us feedback through forums, where we get ideas from about a version but also for the future. The amount of feedback is always more than we can handle. Then it is a matter of what is most often asked for.

But how important is this feeback exactly compared to own ideas?

That .. is, really important. It is number one in the development. Own ideas do certainly matter too… You can not only go from the things that are asked for in the community. Such thinking mostly stems from the things that are already there. And we try to add things that are not yet thought of. That is were new ideas come from. We have a group in Adobe that is solely considered with this. Eh.. Some techniques also already exist.

Last year for instance we made a mistake by giving a sneak peek in our kitchen. We showed how to make a sharp photo out of a blurred photo. Everyone loved it, of course. And this we could really do with an algorithm, but only on that particular Photograph. (It dealt with only one kind of blurred photos) So it was not really ready to fit in the new version. But because you show it in public, they think that it will be added in the new version. We then had to explain that this technique didn't always work as well.

Other functions are just not workable yet, because computers don't have the required (processing) power. This I mainly the case with filters.

In addition to the beta testers and the shelf with ideas we have for our own, there's also the online for a and an online form anyone an fill in. The latter might feel like a black hole, but it all gets read by the developers.

Do you differentiate between the online and offline group?

Hm..Not as far as I know.

We do of course look more carefully into the opinions of our known users of which we know that they are experts with Photoshop. Beside this, We ask ourselves, Is it a must have? Do we have the time and resources to make it? And it also has to be equally divided over all consumer groups.

<u>Is there any user group that you value more in this?</u>

No not really, we try to give all the groups that we have gathered over the years an equal amount of new features.

<u>What about the name "Photoshop"? You told me that the software started as a means for designers moreover than for photographers yet this name was chosen.</u>

Well, I don't know how they ended up with "Photoshop" There were quite a few options but Photoshop got chosen pretty fast.

The interesting thing also was that, with the rise of digital cameras, we started thinking about whether Photoshop was really that interesting for Photographers. Photoshop was not the ideal tool for documentary and product photographers. It had too many other options, and didn't present them with an overview of multiple images.

<u>Right, Something like a raw converter only appeared later in the software If I'm right.</u>

Well the raw Converter was adopted as a plug-in quite fast actually it was also written at an early stage by Thomas Noll. From these ideas the "Lightroom" application was developed. If you don't want to get creative with filters, layers and stuff, then that's your program. But lightroom allows you to use photos as a database. In addition you don't have to click "OK" for example. Photoshop does not have this. Although we try to work increasingly non-destructive with filters, you have to make more steps out of this. In lightroom the original photo never gets adjusted.

<u>How is decided whether a tool should be incorporated in the toolbox, or whether they are available through the menu?</u>

Well, tools you won't find in menus. Those are only commands only, like selections and filters. All tools in Photoshop can be found in the toolbox. Some are maybe included in other tools, just because there is no room for them. And that is decided by what is most frequently used by our testers and users. Tools thus may shift a little.

<u>But that would also mean that every new version follows behind the users, who decide what is found in it.</u>

Well eventually it might get adjusted if we see that this is not the right place for a tool. We do of course also think about this for ourselves. And, do we want users to immediately see that particular tool.

<u>What decides whether this is desired?</u>

Well, that eh is decides by the developing group "Product management".

<u>And do they take in account aspects like the contemporary aesthetics, of rather aspects that Photoshop believes to be important?</u>

… eh, that I couldn't answer.

Look, when we add a tool, we believe it to be useful to a group of users. So when a tool first gets introduced it normally doesn't end up somewhere in the back. If indeed the tool is not much used in practice, then we will do this later.

Also there's not much space. You don't want to intimidate users with a packed toolbox. We want to make it as user-friendly as possible.

This we also try to do by other means. For instance with workspaces you can create. Within such a space you can put anything. In the newest version we also have a workspace called "What's new in CS6" that introduces the new functions. Even menu items can be switched on and off in personalized workspaces. Certain target groups already have their own workspace we pre-created.

The separate Adobe programs show more and more overlap. Is combining them something that Adobe eventually would strive for?

Well not really, Something like making a contact sheet has disappeared from Photoshop for a version or two. In those versions, Contact sheets were made in Bridge. Since the latter works with a pdf sheet that allowed higher quality. In the end people were used to do this in Photoshop. [So they were pushed to put it back in] The problem is that you really cannot take any functionality away. Even if it is an inferior algorithm, there's always someone who uses it to create nice images.

Right so how gets decided to take stuff to deeper locations?

That's something we do, and still causes a lot of grumpling. An example of this was the "Brightness & Contrast" command. Every Photoshop teacher told people not to use that at all. Those people were kind of right in this. There were better ways of adjusting brightness and contrast. At a certain point we improved this with new algorithms which were more subtle but worked differently from what people were used to. Thus we added a button "Use Legacy", so that if, you would like to use that faulty algorithm because you did something unique with it, you can. This is how we try not to destroy someone's workflow. So throwing things out is really almost not done.

And what about putting functions of one program into another?

Yes, that happens a lot, Photoshop filters in Illustrator, Photoshop effects in InDesign, such things we do because not everyone uses all those programs. It can be easy to have certain possibilities available within the same program.

But isn't it hard to decide were you draw the limit for that process? One could imagine one all-encompassing application, working with workspaces for example.

For years people do think about that, but I think.. it would be a monstrous application. An uncontrollable one, also with regard to the development, such project is uncontrollable.

What we do try, is to reuse as much code as possible. Say you want a drop shadow effect in InDesign, we make sure that we take the drop shadow from Photoshop. So those development groups keep in contact.

I've heard several designers say that they use layers and masks instead of the history tab. Why is the history function still here when you can really do all the non-destructive work with layers / masks?

Yea, well your files become much larger that way. And that goes for everything in Photoshop. Almost all end results can be achieved in a hundred ways.

And then the amount of people that use it will eventually decide what is the most supported way of going?

We have ourselves of course ideas about how a tool should be used and what you can do with it, after that we set it loose in the "world" . Then you find out that people "abuse" the tool and use it in ways that we would have never imagined.

And if everyone will start using layers and masks instead of the history then even something as essential to Photoshop as the history function can be pushed to the back in the interface?

Yes it will get more hidden in the application.

So there are no sacred cows that Adobe won't ever touch?

Hm.. no…. the function that is most used just gets..[more foregrounded in the interface].

Again, whenever we even make the slightest changes in tools, we'll immediately get grave reactions. Changing existing tools is very difficult.

Why has there always been so much emphasis on the artists' workspace metaphor? (Brushes / Pencil / Eraser / Stamp) (Cf. Murray 2012 p. 17)

This is only partly the case. But again, in the beginning Photoshop wasn't that much aimed at a photographers target. There were some tools that were for photographers though... say a crop tool is actually two pieces of cardboard that you can physically move to visualize the crop. A brush is a brush. A Clone tool is a little stamp. These, dodge and burn are actually tools that stem from the photographers darkroom. Dodge is a stick with a piece of dark paper that you can use to distort the beam. Burn was also done with your hands [its metaphor is a hand].

Is the physical equivalent still the main thing that you look at when deciding the metaphor?

Well this one is really new, content aware move, They thought of something that, well that doesn't really have an equivalent in the analogue world.

[Ton opens the first version of Photoshop in an emulator to compare]

Look the tools that were available in the 1.0 version are still there.

Have you never thought about changing these metaphors?

Well they have actually changed a bit.

Take the lasso, that has only gotten a bit rounder

You see that it has changed slightly, but the core shape has of course not changed.

And where did the airbrush tool go?

That one's hidden, we don't have that directly in the new version. It is actually an example of a preset of the brush tool.

But isn't it also important that the airbrush isn't really found in today's analogue design studio anymore?

That's true, we also look at what is used in the actual world of creative professionals.

Does the dominant aesthetics of these professionals also count in future developments?

Hm... I don't believe we look at it in such a manner...

It is true that Photoshop influences how images look. Especially in the beginning we noticed this. With a new version with new filters, you would see that filter used everywhere in the couple of months after the release. That is not so much the case anymore. People are now used to working with Photoshop and people don't want to use only the new effects per se. There are more possibilities today.

Also third-party developers have, from the early days on, been able to make add-ons for the application. That you still see a lot. This practice has been popularized with Photoshop.

There's a whole world around Photoshop, including user groups, tutorials, tips & tricks, shelves of books about Photoshop.

Would you say that Photoshop follows the dominant aesthetics or do you think the program tries to create them?

I think we do neither. We don't create the aesthetics of the day. We facilitate.

And like I said, it **lives its own life**. You put tools in it, and people find new ways of using it. From the beginning it has been like this. Someone creative is not simply happy with the first image he made. He might print his results, ripple it and scan it again to run it through filters in Photoshop. You give them a lot of tools, but after that, what people do with it, how they combine it with other

things, you can't control. You can see trends in that. What kind of images is popular at a certain time. Many images might show fabrics and scratches.

How do you use that information?

We don't really in Photoshop. But we are using this more and more in otherprograms.

[Ton takes his tablet to show applications]

There's these applications that are for the consumer market. One of those is Revel. A program to collect your mobile images at one place. But I really mean these things, we call "looks". These are [instant] filters that are slightly subject to trends. You see that with those "instagram-like" programs. These filters are a combination of a number of commands to give a photo a certain look.

Recently popular culture shows many instances of "imperfect digital renderings" / Glitch aesthetics. Can you –if this aesthetic continues- imagine Photoshop to answer to this trend with new functionality? (new distortion filters for example)

 Yeah, I think that… that might be typically something for a third party plugin.

You also see it in this "Photoshop touch" application only for tablet. There's a number of functions [that are far more basic than the original Photoshop]. You can work with layers. And again there's filters available. Here's something you mean, this "TVmonitor filter".

I assume somewhere a team is involved in deciding what [filters] should end up in that menu?

Yes, and how to make this as user friendly as possible.

Right, but that is not only decided by analyzing user feedback.

Um… no, there's a lot of thinking involved here. Especially with something as different as a tablet. You see that in the way this [filters] is applied is different from the other Photoshop.

But in the end you want to achieve something similar to the original program?

Well, that's not really possible here. The images are relatively small, the memory and hard drive is limited.

So what is the goal of this application?

Little Ideas. Sketching them during for instance travel. Some of these image files are fine for use in web or on other displays.

And what then is the goal of Photoshop?

That is so broad, it is quite impossible to say. It's used in commercial print, video, animation art etc.

And the main way to cope with this diversity is the use of user feedback?

True.

You see a way to… We try to make the application more and more user friendly. Sometimes that means that you indeed drop some tools. If you look in older versions… for instance 3D functionality. Something we only pt in the extended version of Photoshop. Photographers don't really need it so it's not found in the standard version –the new film functionality is found also in the standard because new camera's also allow you to film with them. Before this we had two 3D tools, a camera tool, and a tool to manipulate your 3D object. Those were found in the toolbox. These have seemingly disappeared, they are of course not gone, but only show up when you start working with 3D. If I click here, nothing happens because I work in the flat background image. When I click on the object, I see a new different interface. If I now go outside that object, I have

different functionality from when I click in it, or again when I click above it. So what functions you find available is dependent on the way you handle the object. This is a different way of working. Especially with 3D this is apparent. User friendliness and accessibility… exactly. Before there were two tools. Those had their own subtools when you expanded them. [those are now all found elsewhere in the interface either depending on where you click or in context menus] Still when the 3D mode is on, those "old" icons can be found in the top toolbar. So that people can also visually recognize those. Thus you can choose. The number of tools has decreased here. This was because we noticed that it was hard to handle. Now [in CS6] it is far more context sensitive.

Is shifting to context sensitivity something Adobe would also like to do in other tools and functions?

In this case, it was very useful to do this. For other tools there is no need really.

Why was it useful here?

Because it was so extensive, there were too many tools. Now it is more simple and interactive. It's quite a big change, from 2D to 3D, visually speaking. Other rules apply here. You have to think about things like, how does light behave? You can alter the light source or directly manipulate shadows.

We are still working on interfaces, to keep it as accessible as possible. Keeping the number of tools small but the functionality big. With 3D we try to show only what you need on that moment.

So that is an example of meandering between ease of use and extensive control.

About the latter… we sometimes have a small adobe conference, where new technological innovation is shown internally. A lot of first builds of new algorithms and stuff is shown there. When you see that again implemented in an actual version of Photoshop, you hardly recognize the original function. The amount of buttons, parameters and slides in the original algorithms is too big for the commercial version. So that is another thing, thinking about how to translate that to something people can handle. You want to give them deep control but keep it understandable at the same time. That is a continual balancing.

But something like "Content-Aware", moves Photoshop away from this autonomous control. Photoshop becomes a butler with this.

True, wherever applicable we try to do that. We implemented Content-aware in multiple tools so that you can use it in different scenarios. It also has a random component now. Everytime I Content-Aware fill a selection it will turn out differently. This way I can just keep trying to fill it until I like the result.

But this also means giving in some control.

But you probably want to have this random aspect… sometimes you don't want to use content aware and you need a different tool.

Was the decision to implement Content-Aware in the new version a hard one?

No, … With every new version there's always a few functions where people go "wow". This is one of them. The decision to implement this is not hard. As long as the algorithm is ready for it. Same goes for the de-blurring technique I spoke about. If that had been ready for use, we would surely have implemented it.

But doesn't it contrast with the line Photoshop normally has, namely more control.

Well…

On the other hand, it is also usability: getting to the same result in less steps. Even If it doesn't exactly do what you would want it to do. Say you get it 90% right, you'll just do the remaining 10% by hand. Doing the whole thing by a clone tool for instance would take much, much longer.

How does Adobe feel about the idea of the computer as a companion – helping out the user whenever needed? Is this something you pursue?

… you mean on the one side, you give a lot of control, and on the other side you take some.

Those are matters of getting to the goal quicker. To achieve a certain goal in a shorter time-span always remains one of those things that prove important. Opening files quicker, working with less memory, are not found in a menu but do indeed improve working with the software.

But Content-Aware could also have been named differently, so that the computers awareness would be less foregrounded. How has the decision making there been?

Oh, that I wouldn't know.

Thinking of names is a task for product management and product marketing.

[Continues to show another example of Content-Aware]

But for questions about names I should ask another department?

Well what we try to do is take from things people would recognize. You see all sorts of things that have-if possible- an equivalent in the analogue world.

And if this is not possible, like content aware move?

Then this gets more abstract. The same goes for red eye reduction.

Can I ask someone else about things like why names are chosen?

… I wouldn't really know who you should talk to then…

20-06-2012 Angela J. (AJ) – Graphic Design

General questions:

Understand history and situation of context.

> *Angela graduated at the St Lucas art school in Eindhoven in 2002. After this she completed 'Visual communication' at the Design academy. During her student years she has always been playing around with the software doing small jobs like inventing companies logos and visual styles. After graduation she directly began a business for herself.*

> *Her one-man designing company 'Angela ontwerpt' was started in 2007. With this business she adopts a broad range of assignments and projects ranging from designing visual styles to product- and concept design.*

> *She doesn't normally designs publications and books but does a lot for print when designing for instance flyers and booklets.*

> *With her sisters, Angela is involved in another company, which holds a webshop in vintage clothing. Angela does a lot of retouching on the many photos that they make for every new piece of clothing.*

Is there any contact with other studio's or colleagues?

> *"I actually really hate to work alone, so I always try to work in a team. That is probably my strength: trying to venture into fields that don't normally belong to my own background. When she came to the Little mountain organization just after its founding in 2007, she immediately saw this was a great place to start. At the start there were already not only graphic designers and we continue to be a broad collective.*

> *The variety of peers makes it easy to get some extra knowledge about many creative processes. Questions are easily asked, "I more easily walk to a for instance Lotte or Simone [colleagues I previously interviewed], than looking for tutorials on internet. [...] This is always done in a real informal contact which I really like. [...] We additionally had a few workshops centrally done by local peers. But we hadn't done this for a while."*

> *Collaborations are also often done with Angela's peers in (and outside of) Little Mountain. These can range from working on a physical clockwork with industrial designers to incorporating 3D objects in her design which are done by other designers.*

Are there any other peers that you draw on for information about the creative processes in your business?

> *Grafisch lyceum St. Lucas was her technical base also in learning how to use software. With a lot of practicing I learned a lot there. "Other than that, Photoshop is really my favorite. I think at the time I also developed a lot of knowledge myself." Angela remembers her being a real Photoshop junky doing a lot of work she now refers to as "90's" involving "slick fades and dark figurative images"*

> *Another influence was the experience at internship. "At the moment I think that everything I wan't to use, I can readily find and bring out in Photoshop. What I worry about now is the optimizing the workflow. [...] My questions today are more about productivity"*

> *Now," I like to sometimes check out youtube-like Photoshop sessions. I think that's quite fun and interesting, I might learn something from that.*

Observation:

What software is used?

> *Photoshop*
> *Illustrator*
> *Indesign*

> *Angela doesn't like to use Camera Raw because she does not usually shoot in RAW format.*

> *Almost always uses all three. "I am however most capable in Photoshop". Even jobs that I should do in illustrator or InDesign I often start in Photoshop. They don't have the function that whenever you have a text, you can easily go through all the fonts and see the actual text change instantly. Photoshop does have this, so I would often start there. [...] luckily you can now easily drag text objects into the next program."*

> *For jobs where the image is central and that have only a little text, Angela often solely uses Photoshop. "I am sometimes quite lax. In theory you should really make images in Photoshop, do any text layer in Illustrator and join the two in InDesign. But I don't do that, I understand that whenever it should be printed at large size, it must be done, but with a flyer like this I think it's such nonsense to do that." Whenever working together with a colleague she is reminded to this by her peers that constantly have to ask her to work in InDesign. "I usually reply, 'you don't see the difference, so why bother'"*

What hardware is used? (PC/laptop/additional interfaces)

> *Angela always works on her Macbook Pro connected to a Samsung monitor. This she only does to prevent RSI. The screen on the Macbook is better, sometimes she slides her work to the macsreen to check the colors and contrast.*

> *In addition to a separate keyboard she uses a pen tablet. She takes both to all her different working spaces. Once she almost got RSI mainly because of using many shortcuts on the keyboard.*

What tools / functions are often used in your practice?

> *One thing that Angela has done a lot in Photoshop is retouching the fashion photographs she shot for her online store. Working fast is key here, as every piece of clothing should be photographed but is sold only once. The modifications of these images is done in several quick steps:*

> > Cropping by making a selection using the crop tool.

> > Adjusting the Curves on the .jpg layer itself by selecting the curves window from the menu. Adding a bit of "mid" and some "high" by hand.

> > Use the Dodge tool – set at midtones and an exposure of 27 % to lighten things up. Angela is very happy with the upgraded Dodge tool in CS5 that can now "use dodge over a face, you don't mess the whole picture up." Angela uses Dodge to white out the background the dodge tool now registers and skips the pixels of the face of the model.

> > Saving with the action ' Save for web', always in a new folder. This she does without thinking, "It's a quick thing you don't think about. So if the computer is just a tiny bit slow, it annoys me. That is why I create an action, Saving for web takes ages to load." Angela creates a new action for every shoot she processes as the files have new destinations every time.

"This is for now the quickest way to do this, but it would be worthwhile to research whether this can be done more efficient. I at least didn't find such a way yet"

Above workflow describes Angela's usual way to process fashion photos. For other jobs she will have to design with graphic elements. Typical for these jobs are the following actions.

"What I do is make images"

"At the moment I'm doing the visual style for a fashion campaign. [...] I try to.. What I like is 'obvious fake'; showing that the image is indeed shopped [Photoshopped] It's kind of going back to the 90's video clip style. Customers will sometimes not understand this intention and ask me why I didn't make it more pretty, while in fact the aspect they point at were deliberately 'crappy'. [...] Luckily after all this time I can do jobs for people who will mostly understand my vision."

"I really like to – like some sort of canvas – to experiment in Photoshop. The elements will of course need to be redone in vector format in other software later, but just for quick placement, I always use Photoshop"

Angela always makes drafts in Photoshop to show her ideas to customers in early stages. As this is such an early stage, she uses anything to portray her ideas, including pictures that you can't commercially use. Just to show quickly show her idea.

In making the eventual version Angela makes sure she uses other images, preferably her own. This can include personally shot photographs but also drawn elements that are scanned. Another way of going she uses a lot is to go with an existing photo or image –found on Flickr – and just alter it until it is unrecognizable as the original.

"I am also not the kind of person to make a new layer on top in order to 'work safely'. I will rather waste the original because it takes far too much time. [...] I can do it, when I have to, but I really don't prefer it. I really paint in Photoshop, like an artist would... that's my favorite." As such Angela uses layers only to be able to freely superimpose the different elements, she then still works with many layers but not with a non-destructive approach. She also uses hardly any masks. Separate objects go in separate layers to combine on a composition level. "What I do often do is make interaction between layers [using different blending modes] and then erase a lot to decide their combined output. "If it's gone, it's gone and I will just go from there again."

"In order to connect the elements and get them closer together I might use a filter – these are of course really 'wrong' to use – but I especially like Distortion and Blur. "

Somewhere halfway, whenever Angela feels like she's getting at something, she flattens the doc and goes from there.

Can you think of an instance in which Photoshop does not work as you want it to work?

"Not really, I think I know what I want to do and how to do that, I do believe that there is a lot that can be done and I don't know. I'd happily take a course to discover more in the software. An intern recently showed me the 'Liquify' function that they use for portrets really often, but I hadn't heard of it before. So I think I would be able to do the things I want to do in say, Photoshop 9. I don't really care for new versions of Photoshop to come out, but when I discover that they updated one of my tools, that's quite nice."

21-06-2012 Dirk H. (DH) – Graphic Design + Photography

General questions:

Understand history and situation of context.

> *Graduated from the St Lucas art school in Boxtel, Dirk has majored in 'Media design'. After his graduation he did two internships with a photographer and a designer. In 2011 he started a one-man business in graphic design with a big role for photography. Customers include predominantly fashion and music agencies.*

Define role within organisation/business.

> *Dirk experiences having a one-man business as very informative and he learns a lot of things he thought he would not like.*

Is there any contact with other studio's or colleagues?

> *At the beginning of 2012 Dirk started in Little mountain. Within this incubator of creative start-ups he does notice the thin line between colleague and competitor but the friendly interaction emphasizes the first rather than the latter. As everyone has his own specialty - mainly depending on background and network – Dirk has a lot of opportunities to learn from his (physically) close peers. Everyone is willing to talk about his specific part of his profession. "The kind of customers too is dependent on your network."*

> *Every Monday morning the Little Mountain team has a meeting to discuss local and general issues. The most contact however is informal and quickly done. The knowledge exchanged is about both technical and business matters. Even when meetings are scheduled there is a high degree of informality as all residents are on friendly basis.*

Are there any other peers that you draw on for information about the creative processes in your business?

> Knowledge about software and Photoshop in general, Dirk has found in several places. At school he learned the fundamentals. "More advanced tips and tricks I got from my internships". At the photographer Dirk interned at for instance he learned how to work with "a backup within the psd file." Within the practice of his own company, Dirk now occasionally learns some details about the software. New versions with new features are also closely watched. "I don't really come across new features"

Observation:

What software is used?

> *InDesign*
> *Photoshop*
> *Illustrator*
> *Lightroom*

> *"Indesign has the central role in my usual setup. Photoshop and illustrator normally have a supportive role."*

"The exact order of programs is of course dependent on the project at hand. Do you only work with photos than photoshop is central. If you have to make a logo this will more likely start – and end – in illustrator. "

Dirk Works faster in illustrator than in Photoshop. Especially the guides and snap features are very well done in illustrator. Photoshop on the contrary feels – when designing – more like "being in an ocean in which you throw stuff quite randomly. " Showing the way a design is going to look without guides for instance is not as easily seen in Photoshop as it is in InDesign. And illustrator. Because of the lack of features like this, the same assignment in Photoshop will take more effort than in for instance the other two programs.

As Dirk also does a lot of photography, he uses Photoshop's Camera Raw converter to convert and adjust his RAW image files. Lightroom is only used whenever he works with a great number of images in a series.

He owns the CreativeSuite4 package and notes that this version is by far the most heavy – hence slow – version of the package. "CS 4 has the most tedious Photoshop … Everything after 4 has became lighter [in terms of RAM useage and everything before, was lighter. 4 really was a peak in this" This was experienced by Dirk when switching between multiple programs and by verifying with peers.

What hardware is used?

Dirk uses a Macbook Pro controlled by a double buttoned usb mouse.

At home he owns a calibrated Lacie monitor. Whenever he is not sure about how a color will look in print he first checks his design at this monitor.

What tools / functions are often used in your practice?

A typical workflow of Dirk's would for a photography project be:

Decide whether in the layout a photo should be standing or lying down or cut out.

Import the RAW file through Camera Raw in Photoshop.

Lens correction - "With a wide lens opening for instance, the corners might be darker than the middle of the image. I Make sure that the photo has an even amount of lightness."

Saturation - Whenever big changes need to be done Dirk does this in the Raw Converter. For more subtle adjustments he works the saturation in within the Photoshop file as he can than go back and forward in history in order to compare lighting situations.

Correcting over- and underexposure.

"In Photoshop I always start with adjusting the saturation. In general I take 10 to 15 % off" This is done in an adjustment layer. Important here is consistency when doing bigger series. Dirk uses many layers, tagging them on or of in order to compare results. He hardly ever works extensively with the history. "At most I will go back one stap with CMD Z. So the photo in my background layer will always remain the original that I can always come back to. That's why you can really just ignore the history and just build on top of this [background layer] to get to the final result." Using the "Current and below" function Dirk manipulates the background image on a separate layer without copying all the background layers

data. This then saves a lot of data space. "I also add a layer to separately work the 'curves'. I don't usually use the levels window as curves is more visual to me."

"The photo is then finished and will be used either by me or (as in this example) by other designers, adopting the photo in their booklet, flyer or web design."

A tool that Dirk also uses a lot is the Info tool to compensate for the color distortion in his laptops monitor. This tool in combination with his experience on the high-end Lacie monitor, enable him to accurately assess his colors.

Actions are used solely to save different settings. "It is ideal for saving many images after another. ... what I would like to find out is whether you can include pressing the play button in the action so that you don't have to press the button on every file." The actions are made separately for different outputs. Actions are not used for layers or other adjustments , as these are few in numbers anyway. Retouching has to be done per photo anyway.

As much functions as possible are accessed by using shortcuts. "The only thing I click on are the adjustment layers. Those are the only thing I physically click on"

Can you think of an instance in which Photoshop does not work as you want it to work?

Dirk's only frustration is that the program will sometimes crash whenever his RAM memory is overloaded. "This is however hardly to blame on Photoshop."

"Other instances not so much because I really kind of know all the tools I use; the guidelines, grids and shortcuts."

Are there any functions in Photoshop that you would have rather seen implemented differently?

Using InDesign, Dirk notes that some functions will disappear when new versions come along. He misses a function that arranges pages of a book or booklet at any given moment. Within Photoshop he has not yet encountered a similar problem.

Functions that move from one program to another is not problematic for Dirk. He will simply drag the designed objects to the right program and continue from there.

13-06-2012 Kim M. (KM) – Graphic design

General questions:

Understand history and situation of context.

> *Kim has graduated from HKLS Sittard in the direction Photography, publicity and design. After that she has worked at several design companies and publishers. In 2009 she eventually started her own business.*

> *Kim mainly works alone and designs for print media.*

Is there any contact with other studio's or colleagues?

> *In 2010 Kim joined Simone W. in their office at het Klokgebouw. Unlike Simone, Kim has not been working in the main space at their floor which hosts room to many start-up companies. As such Simone is her main peer.*

> *New assignments and projects are often found through other designers and people Kim has previously worked with.*

Observation:

What software is used?

> *InDesign*
> *Illustrator*
> *Bridge*
> *Acrobat*

> *Photoshop has a supporting role in Kim's design practice. She only uses the software for image editing tasks. Whenever photographs come in the picture, Kim switches to Photoshop. Some illustrations are made in Photoshop.*

> *Most of her work is done in InDesign.*

> *Illustrator is used when much text comes in and when designing logos. Also whenever designing for web Kim uses illustrator.*

> *Bridge is used to have a quick look at a selection of photos.*

> *Much of her work is compressed with acrobat in order to send work around easily and accessible.*

What hardware is used?

> *Kim uses a Wacom pen tablet to work precise. Using the pen tool long however cramps her hand so she goes back and forth between pen and mouse.*

> *Keyboard is used regularly but not for other than standard practices. Shortcuts that Kim uses are mainly the ones used in the Mac OS and no additional Adobe ones.*

What tools / functions are often used in your practice?

> *Every project is started differently. Kim doesn't have a fixed scheme she works in. Instead she goes from the specific assignment. This could mean that she'll start by drawing on*

paper, start from images found on the internet (logos), or start directly in InDesign making several options of which she chooses a final one (layout).

Pen selection is used whenever Kim wants to select a specific part of the photo. The lasso tool and magic wand are not as precise and easily changed. Hence these tools are only used to quickly select rough areas in sketches. With paths one can at a later moment easily select and alter the path and make a new selection from there.

Kim always uses layer masks. She hardly ever deletes image information. Instead she uses layer masks to hide certain areas.

In addition she uses many layers. Upon every important choice she is not sure about, she creates a new layer. "I practically save everything I do". Eventually I clean up the document and save a final copy consisting of fewer layers and complete and precise layer names. Sometimes she'll do this whenever she loses overview, making a new cleaned document to continue working from.

Actions are only used with batch processes. A typical action is the conversion from RGB to CMYK. Kim however, for projects involving fewer images, prefers to judge every image separately. That way she has full control over the conversion. She will for instance use the levels window to compensate for the loss of bright colors in conversion.

Kim doesn't work with a saved custom 'workspace'. She sometimes drags a commonly used tool or window into the 'Panel' area.

Can you think of an instance in which Photoshop does not work as you want it to work?

"As every photo has its own characteristics that need different handling, Photoshop to me is always at least a bit of a search"

Adobe's helpdesk has never showed her anything she was looking for. Instead she uses internet and searches blogs to find solutions to her problems. The problem with the helpdesk is that you need to know exactly how a tool or situation is called in 'their' language.

"I did have some moments in which I was puzzled about where certain things came from. But that has nothing to do with Photoshop but rather with my own knowledge." An example of this was a moment where Kim was puzzled about what part of a path was selected as the changeable area, the insight or the outside.

Are there any functions in Photoshop that you would have rather seen implemented differently?

Kim cannot really think of an instance right now.

20-06-2012 Lotte M. (LM)– Graphic Design

General questions:

Understand history and situation of context.

> *Lotte graduated from the art academy St. Joost in Den bosch / Breda. She majored in Illustration and took several minor programs in graphic design. Hereafter she did a course 'Allround media Syling' at Vogue academie. After a year at the university she started her own business in 2009.*

Define role within organisation/business

> *Lotte thinks it's nice that you have to do all kinds of things in a one-man business.*

Is there any contact with other studio's or colleagues?

> *Lotte joined Little mountain in januar 2011. When introduced by Angela. "In this environment I tend to stray off of my own illustrative direction. Illustration is very broad, and broadly applicable. Last year for instance I designed some 3d objects while staying true to my own style."*

> *I really like the easy cooperation here. Before I had only worked with several illustrators together, but this diversity is much better. Everyone knows his own field, and exchanges info in an informal way." This is very convenient when it comes to information about software and ways to design or illustrate. Before consulting the internet, Lotte would first ask her physical present peers.*

Are there any other peers that you draw on for information about the creative processes in your business?

> *Collaboration and knowledge about having a business is also shared with peers outside of Little Mountian. Lotte for instance joined a networking group.*

Observation:

What software is used?

> *InDesign*
> *Photoshop CS4*
> *Illustrator*

> *Lotte does notice that in CS4 Photoshop is worse, or at least slower than CS3*

> *In Lotte's case it is difficult to describe a typical job as she works on many different projects from various customers and with various peers. Accordingly her use of the software is very diverse.*

> *Fact is however that Photoshop always holds a supportive role compared to other programs. She often starts in Illustrator but always switches to Photoshop when photos come in.*

Projects are very diverse, Lotte likes this as you get to know many things. "Illustration doesn't usually offer much full time work so doing a lot of graphic design was a logical step for me."
Recently the degree she uses a certain program for her illustration work starts to shift. Where she would before scan her hand drawn images into Photoshop, she now often draws digitally in Illustrator.

What hardware is used?

Lotte uses an IMac as a fixed workstation when she is at the office. She combines this with a Macbook pro to work on location. Whenever it is convenient Lotte also takes this computer to her workspace at Little Mountain.

She always uses a tablet instead of a mouse. For instance to directly draw in illustrator. Whenever working on location she also brings her tablet. Lotte also uses the trackpad on her Macbook to navigate sometimes.

An Apple Time Machine backup centre saves her data automatically.

What tools / functions are often used in your practice?

In addition to illustration and design, Lotte does some product photography. These photos are always touched up within Photoshop itself. Lotte shoots in RAW format and "When I open these images, they are automatically opened in Photoshop."

"Illustrations I did – especially during my studies – make with Photoshop. After scanning them, this is the software that works easiest for them. Using layers on top of each other and that kind of stuff is easier than in InDesign." Lotte also uses Photoshop in this context to add elements to her photo that look drawn or cut and then scanned, but which are in fact made digitally.

Presently Lotte is designing a full website in Photoshop, which she then forwards to the web builder who is (in this case) also part of Little Mountain. This way Lotte can offer a full package to the customer, delivering a complete website. In this process the first phase is developed in close contact with the customer. Pages are fixed and the customer might add some restrictions like the 'no photos' demand in this case."Other than that there are not many restrictions to building a website. A lot is possible and especially in my part of the process I don't have any technological things to take in mind." After a few seconds: "well, here for example I need to make a part of this curve straight as the design in itself has to be scalable for the programmer."

Probably though the most typical work order for Lotte is found in Illustration.

In combination with illustrator , Photoshop is as often used as a tool to make sketches to be extended in Illustrator later on. "Composition and raw elements are easy to put together in Photoshop. I do this because it is a program that I work in more easily. Also Illustrator for a long time had no tool to draw with. Now they made a brush with which you can draw too."

"What I often do here is remake the Photoshop illustration in Illustrator. Tracing in Illustrator I do automatically in Illustrator. But sometimes when precise work is needed for a less clinical feel, I'll do this by just zooming in really close and draw the paths. But really I don't like these vector illustrations too much."

The next step then is to retouch the Illustrator file in Photoshop again before getting it into the website design.

Can you think of an instance in which Photoshop does not work as you want it to work?

"Quite a lot really, but I can't remember those moments right now. Err, well, Photoshop on windows always slows down and just quits, it works so much better on a Mac system."

Are there any functions in Photoshop that you would have rather seen implemented differently?

"I don't really understand why some functions are not available in Photoshop but are available in other programs. The lack of a brush tool in Illustrator for example annoys me. Also In Photoshop you can draw and erase far more precise than in Illustrator. "

13-06-2012 Simone W. (SW) – Graphic design

General questions:

Understand history and situation of context.

> *Graphic design is the core business of Simone. Often this takes the shape of publications like magazines and books. Info-graphics and brochures are other frequent projects.*

Define role within organisation/business

> *Simone has graduated in 2000 at the Sint Lucas school in Boxtel where she had classes in graphic and spatial design. Later she completed the program Man & Communication at the Eindhoven Design Academy.*

Is there any contact with other studio's or colleagues?

> *Projects are often done in collaboration with colleagues. These are either befriended graphic designers or necessary collaborations with creative developers like web builders. In most collaborations Simone has a key role of organizing communications in addition to her designing work.*

> *"This means that you have to deliver the documents properly" … "You have to think well about how to start a document and how to build it"*

Are there any other peers that you draw on for information about the creative processes in your business?

> *Knowledge about Photoshop is only found in the design practice. When she had a Photoshop class at Sint Lucas she worked with Photoshop 6 in which you could for instance go back only one step in history. Knowledge about Photoshop came mainly after her education.*

> *Learning from experience also includes frequent informal discussion about personal uses of Photoshop. These talks mainly concentrate on new functions and smart [efficient] application like using shortcuts and recording actions. These are often used by Simone.*

> *Simone's Boyfriend is photographer who she knows, uses a completely different set of functions in Photoshop. On the few occasions that she has to use any of these functions, she does so without knowing exactly what parameters to change. She describes her use of for instance histograms as "I just pull the markers in order to see changes occurring, whereas he [her boyfriend] knows exactly what those do".*

> *"New features like the 3D menu (…) or implementing moving images, I have never used" Simone is however very glad with the fact that Photoshop presents such elaborated possibilities that extends over professional borders. Because they work in the same program she and her boyfriend now easily understand each other's creativity.*

> *Learning new features when needed is typically done in the following order: examining the PS interface for 'hidden' functionality. > Searching the internet for the appropriate solution (in most cases this is where she finds the answer) > using the Ps help application. (This solution is experienced as cumbersome and doesn't have preference. On top of all too much planes of text, It requires Simone to reformulate her question whereas in the internet a direct question can lead to the right answer)*

Observation:

What software is used?

> *Photoshop CS 5 extended*
> *InDesign*
> *Illustrator*
> *Acrobat professional*
> *IWork*
>
> *Photoshop is used often but not in all projects. The typical projects that Simone uses Photoshop in are design for web. Here she does not need to worry about how her images will look in print. What she sees on screen is what will be the actual output.*
>
> *Illustrator is mostly employed for logo's, info-graphics and illustrations combined with text made for print. Book layouts, brochures and typographic work are designed in InDesign often by importing the Illustrator documents. These programs are most commonly used by Simone.*
> *Photoshop is mainly used for designing web pages and applications. Simone will make all main pages of a website she has to design. Every element then goes in a separate layer so that a web builder can process each element separately.*
>
> *Animations are done in a similar process as the web based work is. Simone delivers the designed artwork and storyboard to a motion designer who will often use After Effects to process her Illustrator files.*
>
> *For all these projects goes that whenever a photo is involved, she will likely turn to Photoshop. And use it supporting or complementing the other program.*
>
> *Bridge is hardly ever used. "It takes a long time to start, and I don't really understand its functionality… But I guess it is easy to select and rate photographs. You can then later select only the pictures with a specific rating".*

What hardware is used?

> *Simone always works with a Wacom pen tablet. She uses this as additional navigation, select and drawing tool. (apart from the right-button she didn't assign any extra buttons.) This is always done in combinative with a scroll-less mouse. She is a lefty but has always used the mouse on her right hand. As such her left hand adopted the more "precise" pen tablet. Digital navigation is done mainly with the tablet sometimes alternating with the mouse. Most frequently however the two are used in combination as the mouse is mainly used for scrolling. On the Wacom no additional keys are assigned. Simone also intensively uses the keyboard for shortcuts and hotkeys.*
>
> *A Macbook pro is connected to an external monitor only to have a bigger image. No quality of the screens is taken into account here.*
>
> *Lastly a Time Machine system backs up her files.*

What tools / functions are often used in your practice?

> *Selecting commonly used tools is done by the standard keyboard shortcuts.*
>
> *When using the selection tool Simone often uses Auto-select and the tag-boxes group or layer.*
>
> *Masks are mostly used in one specific way: to fade parts of a photo. Typically Simone selects a layer with a photo she wants to fade. Selects mask mode. Use the gradient tool to drag a*

gradient over the picture. And delete the mask selection. A typical application of this technique is the wet-floor effect.

Simone uses the stamp tool to smooth out photographs. Her boyfriend in addition taught her to use the healing brush tool for very specific areas. She calls this the 'repair tool'.

Using 'actions':

Simone makes many actions. In most cases these are recorded in order to batch process a large selection of documents. For instance when having to translate many files from RGB to CMYK color profiles. She makes a new action for every new scenario she comes across. "I am always unsure whether there isn't something else included in the actions I previously made, and if it will get me the same output. ... additionally I don't name my actions properly so I can't be sure what they'll do later on."

At one moment Simone co-worked with someone in Amsterdam on a school photo project. They wanted to be able to simultaneously work on their own share of photo's while being sure that they sarted with the same modifications. She then researched a solution and found out that actions could be exported. In order to make clear where the file must be saved she made a screenshot to communicate to her co-worker.

In general a typical chain of working steps for making a web banner would be:

> *Sizes, logo and information about the content of the image are given by the ordering customer. Accordingly a document is made with the right sizes and the logo (.eps vector image) is imported as smart object.*

> *She then types the info that has to show in separate layers and then starts making many small changes (size, color, place) until it looks right. "This is how I normally produce. I search for the right look within the process"*

When working with other people on a project, there is intense communication between them. For web pages for instance Simone works together with a web designer. To really keep things clear Simone designs every element of the page in a separate layer. In addition she uses groups and gives appropriate layer names. Also she inserts notes with the note tool whenever she thinks a specific design choice needs more information for correct interpretation by the co-worker.

Can you think of an instance in which Photoshop does not work as you want it to work?

When explaining how printed out contact sheets are used for inspiration and overview, Simone's newer Photoshop version (CS5) seems to have deleted the function. When asking co-worker Kim Meijers about it, she claims that this function is now exclusive to the Bridge software. Simone would have rather seen this function still in Photoshop. But when trying the function in Bridge she is surprised to see how much faster it works compared to the same action done in Photoshop.

Simone highly appreciates the use of contact sheets because when printed out, they allow for better reviewing of images.

When asked whether she will use Bridge for contact sheets from now on she replies: "I will if I have to". Upon immediate internet research she finds that the Contact sheet is now a

downloadable plugin in Photoshop. She immediately downloads it. Bridge might be faster but since her laptop isn't really fast anymore she avoids running several applications at once.

There are not many additional dissatisfying moments that Simone can think of. The only moments are events that she doesn't blame on the software but on herself. She was for instance unable to find why one layer in a group wouldn't move on its own but drags along the whole group. She later learned that she had to untag a checkbox in the upper left corner after selecting the selection tool. Before she found out, she took everything out of the group in order to move only one layer.

Are there any functions in Photoshop that you would have rather seen implemented differently?

"What irritates me about the interface is that you can't easily open several 'Panel' tabs at once. When clicking one, the other one closes. So you'll have to drag these windows out of the panel in order to simultaneously view them. This way the interface gets messy and you'll have to 'clean up' again. "

In Photoshop Simone doesn't have her own workspace preset. She does have one in Illustrator and inDesign because of the above reason. In those applications she uses many panel items at once.

20-06-2012 Hubaer K. (HK) – Photostudio

General questions:

Understand history and situation of context.

Graduated in '81 at the 'School voor fotografie & fototechniek'. '85 brought him his first studio work at a commercial advertising agency in Wijchen. After some years this studio was bought by larger company, Hubaer ended up doing much product photography. From 1997 Hubaer started a one-man business. In addition he has now for 3 and a half years been freelance professor teaching many classes at the Dutch "fotovakschool".

Hubaer's contemporary work is mainly based around product photography complemented with some portrait and public assignments.

Define role within organisation/business

As a one-man business owner, Hubaer is involved in all processes and aspects of his business. As he has worked by his own standards for a long time, he prefers to think about himself as a freelance photographer. He is hired by businesses rather than being a business himself.

Is there any contact with other studio's or colleagues?

Hubaer has a strong relation with a handful of other photographers. Rob M. whom is also interviewed in this context, is one of these close relations. Within this network they exchange not only information but also share customers in the sense that whenever they are too busy to accept new work, they will recommend each other's services.

This network is built on many years of friendship and co-working. Hubaer talks about his friend Marc who was quick in switching to digital photography when the market started demanding this. Marc has thought him many things on this field of work. Hubaers first interactions with Photoshop were in editing scanned photographs in the late 90's. As Marc was pioneering in working professionally with the software, Hubaer experienced Photoshop as the "... only logical program to work with." Especially in the early years this network of photographers had much contact about new features and solutions in Photoshop. They still contact each other about practical problems occasionally.

Are there any other peers that you draw on for information about the creative processes in your business?

At the start of the millennium Hubaer joined a small course In Photoshop at the NIDF (Center for digital photography – Haarlem). Here he has learned to interact with the software in a professional way.

In 2007 Hubaer joined a lecture by Guy Gowan who's workflow and Photoshop method are not widely used, but immediately convinced Hubaer. Gowan has a history in lithography. And approaches Photoshop as a tool to scientifically rework color, brightness and contrast just like the analogue photographic practice was. "This is commonly done by options like curves, histograms and other tools applied directly on the image layer. Guy Gowan however has a different method of working as he consistently applies all of these tools and options on channel masks and adjustment layers instead of plain layers." As such, the effective area of the tool is defined by the characteristics of the image itself. Skin highlights for instance are a gradient as a result from making a selection from channels, this makes for more natural editing.

A friend of Huberts will take over when Hubert doesn't have the knowledge anymore this is typically done for modifications in composition and positioning in a new reality. For instance when adding high levels of complex artificiality to an image that still have to look real. "Whenever the customer demands a reality - I don't usually talk about a fantasy in this context- that could impossibly be photographed, I ask my friend to help me out."

(e.g.: Painting walls red inserting logos while still looking real./ Adding depth and additional products in a truck.)

Another service that Hubaer has recently adopted in his work process is the outsourcing of separating products from background, or 'clipping'. Customers for product photography often demand this to be done by the photographer. Hubaer sends a batch of images to an online company who returns the images in the desired format within a day.

Observation:

What software is used?

Photoshop CS 4 (Hubaer normally buys every other version. So soon his next purchase will be CS 6)
Bridge (which includes a RAW converter that Hubaer often uses)
Lightroom
Nikon camera control pro 2 (capturing software to organize importing the images to the computer.)

What hardware is used?

*Hubaer uses two monitors; one calibrated Lacie monitor is used to continuously show the image that is worked with. Another monitor of lesser quality is simultaneously used and show all the tools and windows that are used (see screenshot of both screens in **Appendix II**)*

The computer that these monitors are connected to run windows. In the studio next to the working office, a Macbook Pro is set up in combination with another separate monitor. This laptop is connected to the camera used in the studio. This way photos can be immediately transferred to the computer.

At the workstation Hubaer uses a Wacom pen in addition to his mouse and keyboard. He goes back and forth between the devices mainly using the pen for brushing and selecting while using the mouse mainly for getting around. Any process that requires a double click is done with the mouse. Hubaer is not used to using the buttons on the pen or the tablet.

What tools / functions are often used in your practice?

" I use photoshop in order to create a certain reality, that looks as the customer wants it to look without showing that it's photoshopped"

A typical work process for Hubaer:

Hubaer always start in Bridge and gives a selection of RAW images a certain rating. For this he uses the star system in Bridge.

Next the raw files are opened in Photoshop's raw converter. Here Hubaer does some elementary changes like adjusting the color temperature (changing this in Photoshop would adds colors to the file instead of bringing colors that are already there more to the front), exposure, brightness and contrast. Another thing that Hubaer always does is disabling the automatic sharpener that would in its normal state would add artificial sharpening to the image. This is explicitly done in Photoshop after the raw convertor stage.

Then in Photoshop Hubert uses Guy Gowan's 'Retouch action set' for every picture he works with. This is a set of actions that Hubaer purchased from Gowan's company. And which consists of actions using a wide range of tools often used by photographers. The actions however not simply apply a tool on the selected layer, but it creates an adjustment layer or mask layer to select only the relevant image pixels to apply the tool (or combined tools) to. Functions include 'Range', 'H' (for highlights), 'S' (for shadows), 'Clean', 'Boost', 'Burn', 'Dodge' etc. All of these actions are applied in sequence with one click on the 'Retouch' action button. The sub action 'Sharp' for example, is a combination of the sharpening tool and other subtle functions. As such the outcome is different and according to Hubaer, better than the sharpening function in the Raw Converter.

This fast process is easily done for big numbers of photographs. "There is however one downside… the files are gigantic"

When the project has many photos that should be processed, Hubaer opens them ten at the time in Photoshop's Raw Converter and clicks 'done' in order to quickly save elementary changes in the RAW document. The subsequent 'Retouch' action is then applied in batch within Photoshop. Eventually all photos then are checked once for final adjustments (which again almost exclusively consist of actions within the action set by Gowan.

The exact use of Retouch actions are depending on the image, subject and customer. In product photography additional adjustments are often made before the Retouch action sequence. The composition of the product for instance might change after the picture is taken. (beer bottles photographed in one bucket may end up in the bucket taken from another image when this is desired by the customer). In general the difference between portrait series and product photography are respectively; more attention to a consistent overall feel and intensive focus on one final image. These ways of going correspond to the respective customers demands.

Hubaer always works non-destructive. This means that he never deletes any information but works in layers and masks and he saves multiple versions of an image. Guy Gowan's method takes this to the extreme. As every step taken can then be undone 'manually' the whole need of a history is actually gone.

Hubaer saves his files in designed map structure with one folder called 'NEFs' holding all the RAW (NEF) files and one folder called 'Retouch' holding the files that have undergone the Gowan treatment.

Other than the Retouch actions Hubaer uses very few tools. Simple adjustments in the image that do not relate to color, brightness or contrast might be carried out before using the Retouch action sequence. A relatively common example of this would be correcting crooked buildings or perspective. In these actions again the concept of non-destructive processing is followed.

Can you think of an instance in which Photoshop does not work as you want it to work?

Before 2007 Hubaer spent much time on adjusting contrast, brightness and color of photos. Guys method is fast and effective. Photoshop worked the way he wanted but when discovering the advanced technique and workflow of Gowan he changed his own workflow accordingly.

Before Photoshop had a Raw Converter Hubert used a Nikon program to open images and convert them.

08-06-2012 Rob M. (RM) – Photostudio

General questions:

Understand history and situation of context.

A one-man business founded in 2001 that specializes in both social and corporate photography. Both location based photography and in-house studio work is all carried out by Rob himself.

Define role within organization/business

Rob is fully engaged in all creative facets of his business. He is trained as a professional photographer as he graduated the 'fotovakschool' in 1979. Ever since he has been an active photographer.

Is there any contact with other studio's or colleagues?

Information mostly about new hardware is shared with Nijmegen colleague Hubert K. also interviewed in this context] who also owns a professional photo studio.

Are there any other peers that you draw on for information about the creative processes in your business?

Rob often employs interns from photography schools. He points out how these students are often fully aware of new developments of the Adobe software. As such he learns new tips (shortcuts and other ease in handling) with every new intern. Rob is however concerned with the broad use of hacked versions of Photoshop used by these interns. He knows of schools that help students get their hands on illegal versions.

Observation:

What software is used?

Photoshop version CS4 (11.0)
Nik plugins
Bridge
Illustrator 8
Photomatix

Photoshop has a central role in his working process.

Rob does not use Adobes Lightroom as is often done by other photographers. He has tried the software when it was first presented. It did however not suit his needs. A main concern was the tedious process of opening files in both Lightroom and Photoshop. As for some general touching up and concurrent image presentation for present customers Rob used Lightroom. Because the software had restrictions on the high end of image processing, he had to open Photoshop for specific adjustments that could not be carried out with the former software. Doing all this in front of a customer becomes a tedious process.

He thus soon found out that he wanted more high-end options than were available in the Lightroom software.

At the moment Rob uses Adobes Bridge for demonstration purposes.

Adobe Illustrator is used as an addition to Photoshop only in instances when text must be included in a project. Examples are photo-collages that present several photos on one sheet accompanied by some descriptions.

When Rob wants to apply HDR processing he never uses Photoshop. He insists on using the Photomatix program which he claims is the best software to use for HDR. He does not know

whether Photoshop can do the same thing. But does not think that Photoshop offers the same extensive possibilities as the Photomatix software does.

In general a typical chain of working steps for a series of social photography would be:

> *Selecting the best shots in Adobes Bridge. Preferably in cooperation with the customer physically present. Using the star rating system in Bridge, Rob separates the shots that are print worthy.*

> *Opening these shots directly from Bridge into Photoshop opens the raw Converter. Here a number of changes concerning variables such as light, color, saturation and contrast are already altered to correct the pictures. This is often done for a complete selection of images so that the series will have the same feel to them.*

> *As the images are opened in Photoshop other changes are made that –in contrast to the earlier steps – can be undone later if necessary. This is one reason that radical changes to the picture are only made in this stage. Another is the quality of representation. In Photoshop the representation of the image is better than that of the Raw Converter. As such, adjustments in the latter are not as accurately monitored.*

What hardware is used?

> *In the area of his studio three computers are typically found. Two PC workstations are most used. One of which is used to demonstrate the images to customers and another to process them. Both have professional EIZO monitors. An additional laptop is used for on the road presentations and can be connected to another more common screen. All computers run Windows.*

> *Instead of a mouse, Rob for many years now uses a tablet to control his digital navigation. Regardless of the tasks at hand, whether it is professional image handling or checking a website, he prefers the use of a tablet. In relation to Photoshop he explains the advantages relating to speed and precision. "Drawing straight lines is more accurately done with the more natural feel of a pen. A mouse will more likely give you curved lines especially when using the eraser or brushes in a vertical direction."*

> *Photos are stored on an SD card and as such deliberately transferred to the workstation in a physical format and not through wi-fi.*

What tools / functions are often used in your practice?

> *Clone tool – Regularly used to retouch faces on photos. Selecting a low opacity is key here. This makes the "powdering" of glowing skin, spots and sometimes wrinkles more natural. On low opacity, Rob selects multiple other parts of the face to clone from. "Using only one source area has a danger of creating a too simple surface that doesn't look real."*

> *Patch tool – "If you want to dismiss eye bags, then this is one of the most incredible instruments." Select the area you want to replace and when you drag it to the right skin sample, it takes the latter as a source to blend away the originally selected area.*

> *Warp tool –Buildings or interiors sometimes show distorted lines, round where they are supposed to be straight lines as a result of for instance the lenses used. Rob straightens out the lines with ctrl + T > rightclick >Warp. This shows a grid on top of the image that enables the user to "correct" the distortion by distorting the image in the other direction.*

> *Since Rob only uses the .NEF Raw format created on his Nikon camera, he uses Photoshop's build in raw Converter on every picture before doing anything in Photoshop. He opens multiple pictures at once and subsequently does some early correction on the image series. These corrections concern among others color, saturation and contrast values applicable on either the whole image, or a selection.*

25-06-2012 Ingo V. – Graphic Design student

General questions:

Understand history and situation of context.

> *Ingo is a 3rd year graphic design student at the Artez art academy in Arnhem. He has finshed a minor in typography*

Is there any contact with other studio's or colleagues?

> *Knowledge and ideas about the creative processes are often shared with other students both in and outside of class. This is especially done with a small group of students. Tips and knowledge sharing about Photoshop is done informally. Students ask questions aimed to others who they know have more information on the topic. "As I knew and worked with Photoshop before I started at the academy, other students often ask me stuff."*

> *Ingo keeps discovering new features and methods in Photoshop himself occasionally when working with other students. This is mostly the case when working at home with a good friend, or at school in the computer room. "There are many ways to do things ... sometimes others have a way of using functions that are just a bit faster than others".*

Are there any other peers that you draw on for information about the creative processes in your business?

> *As a student Ingo had Photoshop classes in the previous years. Here he learned mainly "basics". "So I learned quite a lot from internet tutorials". Sometimes these are the official adobe tutorials, but more often the tutorials are written ones by users so that the text can be easily skipped through. In addition Ingo uses forums in order to learn about different ways to achieve a result. "I would for instance search for the best way to make a photo black and white".*

Observation:

What software is used? (version of PS and place among other programs)

> *Photoshop CS5 extended*
> *Illustrator*
> *Indesign*
> *Lightroom*
> *Dreamweaver*

> *InDesign is most used, followed by Illustrator. "Often PS is not even used so its position is primarily supportive." A typical use of Photoshop supporting other programs is in creating a true duotone image of an image and import it to InDesign later. For this is just impossible in the latter program. Ingo also uses Photoshop to downsize images to use them for web purposes and sometimes creates small web images that are not easy to create through code.*

> *Lightroom is the program that Ingo starts with when using his own photographs in a design. He imports them with this software and applies most of the adjustments on the brightness, contrast and saturation. "Additional retouching in Photoshop is then in most cases not even necessary."*

What hardware is used?

Macbookpro.

Ingo always uses a tablet at home. Regardless of the software, both drawing and navigation are done with the pen tablet. Very few functions such as scrolling are done with the Macbooks trackpad . Ingo used to connect his macbook to a different monitor, but the screen was outdated and as it even had a smaller resolution than his macbook, Ingo deserted this way of working.

What tools / functions are often used in your practice?

As a student Ingo receives a big diversity of assignments. Still like himself, many students use the same tools. This is because there always already is an input, "you always start from a drawing or photo, and because the end product is never a Photoshop file. "

"In general, there is a quite specific set of functions that I usually draw from [...] I don't really , often make things within Photoshop. The only moment I do this is when fiddling around with functions just for fun."

A step always taken in editing photos is the use of adjustment layers. Levels, contrast and other adjustments will be visible on top of the selected layer so that any changes will not destroy the original data. Ingo often uses the eraser and selection tool to alter mask that signifies the affected area of the adjustment layer.

To change the appearance of a photo more radically Ingo often uses a selection of filters. Whenever sharpening is not applied in lightroom he'll utilize the 'unsharp mask'.

"When possible I like to work non-destructive, that's why those adjustment layers are so important [...] with the unsharp mask however I don't know if that's possible. Often I copy the layer that I'm about to filter and proceed with the copy. But I skip this sometimes when filtering. The first thing I do in many projects is copy my background layer as a backup."

Also Ingo often uses the crop tool to set pictures straight.

The main use of brushes in Ingo's practice is the adjustment of mask selections.

There are a few less frequent processes done in Photoshop that Ingo thinks of.

> *Importing vector images into photographs to combine them within the Photoshop image.*

> *Converting vector images into raster formats. "Sometimes this is done in the vector program itself. Even then I open it in Photoshop just to check and alter the image when necessary"*

"Whenever I finished the adjustments in Photoshop, I'll import them into Illustrator or InDesign. Often I make these into JPG's but whenever I'm a bit lazy it can quite easily be a PSD. The disadvantage of PSD is their size. The InDesign file gets really big when using those." Ingo doesn't take this in mind when making multiple layers but does so when exporting the PSD file into another program.

Ingo prefers to add a layer of typography in InDesign rather than doing this in Photoshop. Only because this is more easily done. "Photoshop is really.., whenever you need to add more than a line of text, well ..it's very annoying. I only use it when the text is either very few, or whenever typography is part of the image"

"When designing a poster for instance [as it has a separate text layer] I will imagine how it will look with text and keep that in my mind." If things have to be precise Ingo adds a temporary layer to see how the elements look together."

Actions Ingo uses for instance for saving his photos for his website. He uses 'Batch' and selects the images and the desired action. Only once he made an action to do something other than saving; this was a case where he applied a filter to many photos.

Can you think of an instance in which Photoshop does not work as you want it to work?

Sometimes the image is too large to process, and I would have to wait for half an hour. If this is the case, I try to flatten and downsize the image. But if that doesn't work then I'll just don't process it in that way.

"At times it appears I pressed unknown keyboard shortcut and I accidentally activate some 3D function. As I don't use it that much, I don't understand anything about those functions yet."

Are there any functions in Photoshop that you would have rather seen implemented differently?

"I often exactly know what I want, And how to get there. I know what's possible. It doesn't really happen that I think of something that Photoshop cannot do"

"I often already have an idea about the image and then start in PS. But in practice, often coincidence plays a big role because of combining for instance certain adjustment layers. When those are – for some reason – set at a certain setting, I can be quite [positively] surprised "

25-06-2012 Jorian B. – Graphic Design student

General questions:

Understand history and situation of context.

> *As a student Graphic design at Artez art academy in Arnhem Jorian minored in typography.*

Is there any contact with other studio's or colleagues?

> *Knowledge about Photoshop mainly comes from the classes Jorian took in the previous years. Before he joined the art academy he had no experience with Photoshop whatsoever.*

> *Contact with other students only occurs when Jorian needs to really doesn't know how to get to a certain goal. As the goals are often partly dictated by the specific assignment, students often use similar tools and functions per assignment.*

> *Most problems with how to apply certain techniques are however handled in the formal setting of the class. There is always at least some time to try things out and ask a teacher about specific problems. You would then first need to have decided what functions you will use for what goal/assignment.*

> Informal discussion with students is more about InDesign. "Here [in InDesign] you work with large amounts of information and there's shortcuts and convenient tips that we exchange in order to efficiently work with this information." In Photoshop this need for efficiency is less pressing. Also he works with this software more natural since Jorian had classes in Photoshop much longer than in InDesign.

Are there any other peers that you draw on for information about the creative processes in your business?

> "I recently used Youtube to find how to make a gif animation in Photoshop. [...] These tutorials are aimed at using specific functions not on how to use them in the best way."

> Jorian uses Youtube before consulting written forums.

Observation:

What software is used?

> *Indesign*
> *Illustrator*
> *Photoshop*
> *TextEdit*

> "Everytime when an image is used, I use Photoshop. Even when an image is only alternating with text, you'll probably want it to be a bit more black or something"

> "The order and combination of programs that I will use is fully dependant on what I want.[...] rather than the amount of text, I judge the selection of software and tools dependant of the style I want my product to be".

> *Jorian often experiments with glitches in his designs, for this he uses the standard MacOs X application 'TextEdit'. Here he opens and resaves the image file and then reopens it in Photoshop in order to adjust some colors and maybe use the image in another larger composition.*

What hardware is used?

Jorian always uses an IMac with mouse and keyboard.

No laptop because working either at home or in school. "Maybe after school this'll be interesting"

What tools / functions are often used in your practice?

Keyboardshortcuts Jorian only uses for basics, the rest is done in menus with mouse.

About the general workprocess Jorian says "I use a lot of layers. Because for every step I take, I will make a new layer to go back, compare and see what works best. The Photoshop files though become really big doing this."

"When comparing layers like this [clicking the cursor at the hide/show icon in front of every layer] I choose one and work from there, but I never delete the layer I didn't choose. Also whenever I merge layers I always save both originals. It does happen regularly that I really go too far, and need to go back to a previous fase. Also after spending a certain amount of time on a project I will save a new version of it and continue from there."

Jorian names filters as the utmost used functionality of Photoshop. Common examples are 'Diffuse glow', 'Glass ripple', 'Embos'.

"I often use those mixed and on top of each other." To "mix" Jorian sometimes uses layer masks to decide what part of the layer should be visible. To select the parts he uses the eraser within the layer mask.

As a selection tool Jorian likes the function 'color select' best. It allows him to work outside of the image parts as represented in the individual layers. He often uses this at the "moments that you're just kind of going wild". "I then use these selections and combine them with those filters that you really can't use. Sometimes however this really doesn't give you anything good. It's a real trial and error process."

An example:

*On explaining an assignment that Jorian recently made, his fondness of combining concept and esthetic becomes clear. He explains: "We [students] needed to make two posters; a graphic and a typographic one based on a Wikipedia page." Jorian made his about the page on tentacle porn that has its roots in Japanese woodblock printing. A major challenge of this assignment was to work with the many information that is present on any Wikipedia page. Jorian makes his integration and representation of information almost subliminal. "Here [in a texture pattern that makes up the typographic layer of that poster] you see the camouflage pattern of a squid. And I deliberately didn't make the typographical poster very readable." Actually no font is used, but, a pattern of round spheres and letters – both Japanese and English – are drawn with a marker on paper. This drawing was scanned and put on top of the squid pattern, the colors of the latter were then saturated a bit, **filter plastic wrapped** and the layer settings put to **something** in order to get a visual result that is hardly recognizable as the pattern of a squid. Instead Jorian's goal was to communicate the strong effects conform the shocking concept behind it.*

The way of working too depends on the given assignment. In the above example Jorian "wanted to make a poster that wasn't fully understandable at first sight." To an extend Jorian works in the moment, trial and error style, but he does know beforehand how he's going to use certain functions. "The trial and error part comes in when making things really 'dirty'. In the sense that I don't really know how it should look, but I do know that it should be 'dirty'.

Jorian doesn't use actions.

Can you think of an instance in which Photoshop does not work as you want it to work?

Jorian cannot really think of a good example.

At one point he was experimenting with different adjustment layers to get the right effect on a photo. But when eventually not getting the right effect he just let it be.