Narratives in Design:
A Study of the Types, Applications and Functions of Narratives in Design Practice

Silvia Grimaldi
University of the Arts London, UK
s.grimaldi@lcc.arts.ac.uk

Steven Fokkinga
Delft University of Technology, The Netherlands
s.f.fokkinga@tudelft.nl

Ioana Ocnarescu
Alcatel-Lucent Bell Labs
France
ioana.ocnarescu@gmail.com

ABSTRACT

Several design studies have looked at the potential of using narratives to enrich the design process or to create more engaging experiences with designed objects. However, the concept of narrative is still fuzzy and open to interpretations, due to its use and meaning in different disciplines and approaches. In order to deepen the knowledge of narrative use in design, this paper presents three categorizations that survey the what, where and why of narratives in design, respectively. First, it discusses five definitions of narratives based on narrative theory. Secondly, it proposes a typology that classifies the occurrences of narratives in design. Thirdly, it analyses the roles and functions of narratives in designed products and the design process. Finally, using the proposed categorizations, it shows strategies for a narrative approach to design richer experiences for products and discusses techniques for the design process. To conclude, future developments of the project are described, including a call for design projects that involve narratives to be included in a database.

Author Keywords
Narratives; Narrative theory; Experience Design; Design Process;

General Terms
Design; Theory.

INTRODUCTION

In the last few decades, design research has made an increasing use of concepts from psychology, sociology, and humanities, to better understand users and to create more engaging product experiences. One such concept, *narratives*, or *stories*[1], has been the subject of several studies in design research. For example, Steffen discusses how and to what extent 'products can tell a story' [35],

Lloyd explores the importance of storytelling in the engineering design process [24], and Forlizzi and Ford argue how narratives and storytelling are useful concepts in designing better user experiences [13].

There are several reasons for the recent interest of design researchers in narratives. Firstly, narratives play a central role in the way we experience the world: they are 'vehicles' that we use to condense and remember experiences [13], narratives "organize not just memory, but the whole of human experience" [39], and they are crucial for our understanding of time and time-based events [1]. Therefore, it can be argued that many product experiences that are memorable or engaging are mentally structured in narrative form by the user.

Secondly, narratives are one of the most natural ways for people to exchange information, because they evoke more meaning and emotion than bare facts [35, 24]. The philosopher Richard Kearney wrote: "Telling stories is as basic to human beings as eating" [22]. The ability of narratives to communicate ideas and to stimulate imagination allows design to go beyond functional purposes and opens new perspectives to imagine, discuss and propose scenarios for the future as in design fiction [40] or in critical design [11]. Moreover, for certain products, the accompanying narrative is often an essential dimension to create subjective and rich experiences with products. For example, the Tree Trunk-Bench from Droog design is not just a sitting object, but also a manifesto and a story about customization and locally available resources: only the chair backs are for sale and customers are expected to source a local tree trunk to install the backs into; before the object is even delivered to the user's house the user will have had to invest a lot of time and effort into sourcing a tree trunk, thus beginning the story of the object before the object is even in the user's possession [30].

---

[1] We chose in this paper to focus on the term 'narrative', as opposed to the term 'story' or 'storytelling' (which is more commonly used in the field of design [13][31]), because the term 'story' comes laden with connotations from everyday use, and is used in narratology to indicate only a certain aspect of a narrative. Most of the literature [e.g., 1, 4] understands 'story' (also 'fabula' or 'histoire') to be the events that constitute the chronological plot

Thirdly, narratives as manifested in novels, drama and movies, are exceptionally effective in creating engaging and memorable experiences and they are used as a tool to understand our own identity and selves [7]. This point has raised interest to incorporate narratives directly into the user experience of products [19], and to use narrative structures to enrich user experiences: "[designers could] create rich experiences in a way that is similar to writing stories: they can carefully plan different emotional narrative elements through time to compose a holistic and meaningful experience" [12].

Lastly, the creation of narratives is already ubiquitous in the design process of user-centred design. For instance, tools like scenarios, user diaries, personas, and cultural probes use storytelling within design teams to communicate user insights, imagine future contexts, and to stimulate creativity [9, 15, 37]. This paper looks at including within the idea of narrative design not only those designs that use narrative within the design process but also those that deliver a narrative from the user's prospective, predominantly looking at when this was intended by the designer. For example those designs that may function or be structured in a narrative way through the user-product interaction, though they may not deliver an explicit "story".

However, despite the scholarly interest and its considerable use in design practice, there is little systematic study of the different uses of narrative in design, nor a clear definition of the subject. This paper seeks to deepen the knowledge of narrative use in design through *narrative theory* – the study of narrative structure, narrative creation, and its effect on audiences – which was introduced by Aristotle and elaborated by Russian formalism, structuralism, cognitivist approaches and contemporary psychology. This rich tradition, with contributions from numerous authors who proposed new attributes and definitions, offers a wealth of information, but also prevents a straightforward application of its knowledge to the design field. The lack of a clear and single definition makes it challenging to compare the different uses of narratives. From a story as simple as a single user insight to an all-encompassing narrative of a design movement over time, narratives appear in design on vastly different scales and levels, without clear overview of the concept as such.

This paper aims to use insights from narrative theory to define the concept of narratives, to explore the use of narratives in design research, and to show the different functions of narrative in design. In order to take this approach, the paper first reviews specific definitions of narrative from narrative theory literature, to make clear which 'type' of narrative is applied in different design practices. Next, an overview is presented that shows six

of the narrative, as opposed to the way these events are told, referred to as narrative discourse (also 'syuzhet' or 'discours').

ways in which narratives have been used in design research. Then, it emphasizes the different functions of this concept in design and their relevant attributes and principles. In the last section, the implications of using narratives in design are discussed, as well as the merits of the relatively new practice of using narratives to structure user experiences over time, which has so far been underexplored.

DEFINITIONS OF NARRATIVE

An exploration of the use and function of narrative in design first requires a clear definition of the concept. Because narratives are both ubiquitous in life and extremely varied in nature – from an office anecdote to Homer's Iliad – it is difficult to converge on a single definition or set of characteristics that describes all types of narratives. The wide range of disciplines that have studied this subject, including narratology, linguistics, literary studies, film studies and philosophy, have defined narratives with a great number of different characteristics, some of which are more relevant for design - such as the occurrence of characters, causality, and elicitation of emotions, and others that are less relevant for design - such as the role of the narrator in a written text, which is not as obviously mapped against the way in which narratives are used in design. In general, definitions of narratives range from very broad to very specific. The most minimal definitions [1] cover almost any representation of events, whereas the most exclusive definitions [27] [2] [34] are limited to the kind of narrative one only finds in novels and movies.

	Representation of events	Chronological	Characters	Causality or agency	Values and emotions	Conflicts and climax
D1	•					
D2	•	•	•			
D3	•	•	•	•		
D4	•	•	•	•	•	
D5	•	•	•	•	•	•

Table 1 – Inclusion of narrative elements in definitions

Because different design practices make use of narratives on both sides of this spectrum we present five definitions of this concept (D1 to D5). These definitions were created to simplify a huge literature of narrative theory and the starting point was an analysis of a range of "minimum requirements" for something to be considered "a narrative" taken from definitions of "what a narrative is" by a series of narratologists from different schools, such as structuralist and cognitivist, as well as from different narrative disciplines, such as literary and film studies. Each of these definitions was then analysed in terms of what elements or requirements were included in the "minimum definition" and these elements were charted on a matrix. The elements were then grouped to come up with five simple definitions

aiming be accessible to designers but still grounded in narrative theory. Five definitions were found to provide enough detail for designers while still being accessible enough without overcomplicating. Each of these definitions is progressively more specific than the one preceding it. Put another way, each subsequent definition attributes an increasing amount of characteristics, thus narrowing the range of phenomena it considers to be a narrative. These characteristics are displayed in Table 1, and explained in the subsequent definition descriptions.

(D1) Minimal definition of a narrative: *Narrative is a representation of one or more events.*

An example from this minimal definition is the one-sentence narrative "It started to rain". It is a simple representation of an event, a "telling" of a story – a change in weather – rather than the event itself. This is the broadest possible definition of narrative: it includes nearly any account of any event, and it is used by theorists such as H.P. Abbott [1] when an inclusive definition is required, for example when analysing narratives which are not specifically a literary text (e.g. Löwgren [25]).

(D2) Definition of a sequenced narrative: *Narrative is a representation of one or more characters or entities in a series of chronological events.*

Example: "Mary was cycling home. She put her bicycle in the bike stand. She opened the door of her house and went inside." The character Mary undertakes a number of chronological activities. Such a narrative is for instance constructed when someone recalls a simple experience, or imagined by children in make-believe play. It can also be the format of a written record that keeps track of a succession of events in a strictly factual way, as anthropologists or a courtroom clerks may draw up. The D2 definition is similar to Chatman's [6], who states that the minimum definition of narrative requires characters (or entities, existents, inanimate characters) and a chain of events. This definition ties closely with a structuralist or semiotic approach to narrative, which tends to identify actants and sequences of events in time and their formal relationships (e.g Genette [16]).

(D3) Definition of a logically sequenced narrative: *Narrative is a representation of one or more characters in a series of chronological events that are connected by causality or agency.*

Example: "John was walking outside. It started to rain. John got wet, so he put up his umbrella." The reader interprets that John (a character) got wet (event) because it had started to rain (causality), which made him decide to put up his umbrella (agency). Simple narratives with causation are for instance used in product marketing: "This fruit drink is healthier than other brands, because it contains added vitamins." This narrative is more effective than the two separate statements without the causal link. Simple narratives with agency are for instance used in user insight

stories: "Mary bought this car because she likes the way it looks and because she was previously disappointed with cars from other brands." The narrative gives insight into Mary's decisions and behaviour. Causal links between events are particularly important in Bordwell's definition of narrative in film [4] while agency is an essential element of fabula construction according to Bal [3]. This definition aligns closely with cognitive narratology, in which the focus is on the reader or viewer's understanding of the story (e.g. Bordwell [4] and Herman [21])

(D4) Definition of a value-laden narrative: *Narrative is an emotion-evoking and value-laden representation of one or more characters in a series of chronological events that are connected by causality or agency.*

An example that fits this definition is the story of the ant and the grasshopper by Aesop [23], which can be summarized as follows: "The grasshopper laid back, enjoyed the summer and did not think of the future. The ant, on the other hand, worked hard to build a food supply for himself. In winter, the grasshopper died of starvation, while the ant survived." This story evokes emotions about the behaviour of the characters, and promotes a moral value: "diligence pays off in the long run". Such narratives can be used to influence user behaviour. For instance, narratives about product sustainability are set up to evoke certain emotions (shame about one's own behaviour, anxiety for the fate of the planet, compassion for the victims of pollution, etc.) and are meant to affirm good and bad-valued behaviour. In literature, Tan [36] is particularly interested in the way film narratives evoke emotions, while Herman [21] is concerned with the cognitive processed used by the viewer to interpret the narrative, including in terms of emotions. This definition aligns closely with a functionalist approach to narrative, which is concerned with the effects of narrative on the audience (e.g. Bruner [5])

(D5) Definition of an entertainment narrative: *Narrative is an emotion-evoking and value-laden representation of one or more characters in a series of chronological events that are connected by causality or agency, and which progress through conflicts toward a climax.*

Most narratives designed to entertain adhere to this definition. For instance, consider the fairy-tale "Little red riding hood" [32]. The story progresses through several conflicts (e.g. between the wolf and the girl, and between the wolf and the lumberjack) towards a negative outcome (grandmother and the girl are eaten by the wolf) but ultimately into a positive climax in which the lumberjack kills the wolf and saves the victims. The story evokes emotions like anxiety, fright, anger and relief through the different events. In addition, several values can be attached to the story, such as 'evil sometimes comes in disguise' (the wolf dressed in grandmother's clothes), and 'eventually good conquers over evil'. This definition is apparent in the structure of typical Hollywood films, which McKee describes at length [27], as well as in Aristotle's description

of the features of tragic plays [2] and Propp's classification of traditional fairytales [34].

These five definitions allow a comparative discussion on the different occurrences of narratives in design practice and on which 'definition level' these narratives exist. In addition, elements from each definition could be incorporated into the design process to create specific types of narratives.

TYPOLOGY OF NARRATIVE USE IN DESIGN

The following section presents an overview of narrative use in design, which places existing examples of design practice into three categories, each of which is divided into two subcategories. These categories show where in the design process and user-product interaction narratives occur, who is in control of the narrative, and which elements of narrative theory are useful for each category. Some narratives are suggested by design, others are completely delivered through design, and yet others support the design process.

Cluster 1:	Design facilitates a narrative
Category 1.1:	Design activates remembered or associated stories in the user
Category 1.2:	Design facilitates in-the-moment story imagining in the user
Cluster 2:	The narrative supports the design process
Category 2.1:	Narratives as tool to understand and empathize with users
Category 2.2:	The designer uses narrative elements in the design process as a tool to spark imagination and creativity
Cluster 3:	Design delivers a narrative
Category 3.1:	Design is accompanied by a narrative external to the object
Category 3.2:	Design structures the user experience over time as a narrative

Table 2 Clusters and categories of narrative use in design

This typology started from a bottom-up classification of a number of design examples that we considered to have significant narrative elements, as well as literature examples of narrative use in the design process and examples of designers explicitly using narrative principles in their designs. The most useful way to group this data seemed to focus on the audience of the narrative (the designer or the user), the timing of the narrative (when in the experience does the narrative emerge) and the agency of the object (whether the object helps to recall a narrative, is accompanied by a narrative or creates a narrative-like or easily narrativised experience).

Although the design examples often fit clearly into one category or the other, there is also overlap, as the categorizations are not mutually exclusive. Furthermore, all of the examples are related to product design (due to the authors' interest and expertise), but the categories could be expanded to include other fields of design.

Cluster 1: Design facilitates a narrative

In the following two categories, the user is both the creator and audience of the narrative

Category 1.1: Design activates remembered or associated stories in the user

In this category, the design does not come with a narrative that was specifically intended by the designer, but it triggers a personal memory or narrative association of a significant event, place, time or person. For example, people may keep certain inherited possessions of their grandmother, like knick-knacks or cookware, on the mantelpiece because it triggers stories and memories of childhood visits to grandma. The object is not specifically designed to contain and activate these memories, but it come to form part of a person's identity. Daniel Miller has written about material culture from an anthropological point of view, and how objects, in particular domestic objects, can come to take on personal meaning and stand in for certain aspects of a person's identity [28]. This category also includes objects that are specifically designed to activate a story of cultural meaning in the user, which are part of the cultural knowledge of the intended audience. For example, Alessi's Anna G corkscrew [Fig 1] can be interpreted to activate associations in the user by using the image of a saintly woman, while also activating different associations through the title reference to Sigmund Freud's famous patient Anna G. A user that is aware of both these cultural associations can create the story of the virtuous woman that seems paradoxically happy with a cork sliding up her skirt [26].

Figure 1 'Anna G' corkscrew by Alessi.

Category 1.2: design facilitates in-the-moment story imagining in the user

This category comprises the most open-ended use of narratives in design. The designer inspires the narrative but leaves space for personal interpretations through ambiguity. A classical example is a child playing with a stick. The child can use the stick to imagine herself in a story, in which the stick can be a horse, a sword, a fishing rod, or a

witch's broom, according to the story she wishes to envision [33]. The stick lends itself to this play because it is reminiscent of these other objects in shape, but ambiguous enough to leaves space for the imagination. But the category is not restricted to child's play. For example, Tony Dunne and Fiona Raby's Nipple Chair [Fig 2] is designed to trigger story creation in the user through intriguing but ambiguous output. The chair features two 'nipples' that seem to vibrate at random times. Because the user is unaware of exactly what electromagnetic event turns the vibration on and off, he or she is likely to attribute some sort of causal narrative to the chair's erratic behaviour.

Figure 2 - Nipple Chair by Tony Dunne and Fiona Raby

Cluster 2: The narrative supports the design process

In the following two categories, the designer is both the creator and audience of the narrative.

Category 2.1: Narratives as tool to understand and empathize with users

Figure 3 Bill Gaver, "Dream Recorder", Cultural Probes, 2004

Examples in this category have become ubiquitous in user-centred design, helped by methods from ethnographic research. User insights are bits of data that need to be captured, communicated and remembered within a design team, and narratives are one of the most natural structures for these purposes. A characteristic example is cultural probes [15], which have gained popularity among designers in the past decade and are widely used in different forms. Rather than recording data by having users answer specific questions, cultural probes stimulate users to tell stories about themselves and their lives [35]. For example, the 'Dream recorder' [Fig 3] makes people talk and share intimate information and authentic thoughts that inspire designers.

Category 2.2: The Designer uses narrative elements in the design process as a tool to spark imagination and creativity

A clear example of this category is the way Studio Weave works on architectural commissions. Their project Freya and Robin [Fig 4], for example, starts as a story about two characters that lived on opposite sides of the lake for which the studio designed observation cabins. The story then becomes the guiding principle for the design of the cabins, and is used to motivate most of the design choices about the materials, forms and functions of the cabins. There are numerous examples of narrative elements being used during the design process as a creativity tool, such as Dindler and Iverson's Fictional Inquiry [9] and Nam and Kim's Design by Tangible Stories [29]. The authors argue that literary fiction can be used as a resource for design. Djajadiningrat and Gaver's Interaction Relabelling [10] shows how in a design assignment unrelated products (e.g., a toy revolver) can open up new space for creativity by bring a different story to the table.

Figure 4 Freya's Cabin looking over the freezing lake

Cluster 3: Design delivers a narrative

In the following two categories, the designer creates the narrative, while the user is the audience.

Category 3.1: Design is accompanied by a narrative external to the object

The narratives in this category are apparent in everyday branding of products and services. For instance, when a user buys a pair of Nike shoes, she is in fact also buying the narrative around it, which is communicated through advertising and word of mouth. Such narratives also exist for ideological ideas. For example, a user might be stimulated to buy organic milk because it includes a narrative of happy cows, health, and environmental benefits. Similarly, modernist design often featured a narrative, either explicitly or implicitly, about what was to be considered 'good design', and even how users could live better lives. Products from Droog design, like the aforementioned Tree Trunk-Bench, use external narratives more explicitly – every Droog product is accompanied by a

story. The recent project Significant Objects [17] aimed to measure the added value that an accompanying story adds to an object. Cheap objects were purchased at flea markets and writers were asked to write an accompanying story. The objects were then sold on eBay with the attached story to verify the increase in value. For example, a glass that was bought for $0.50 was subsequently sold for $50 [Fig 5] The buyers were not purchasing the story, freely available online, but simply the object which acquired meaning through the story.

Figure 5. Glass that increased in price 200-fold with an accompanying story

Category 3.2: Design structures the user experience over time as a narrative
This category features product and service experiences that have been explicitly structured to unfold as a narrative to the user. This is a variant of a design approach in which the designer envisions the interaction between the user and product over time, and carefully plans the sequence of events so that the user experiences the intended narrative. This design approach is for instance common for immersive theme parks, entertainment venues, and luxurious hotels. Furtermore, existing everyday objects can be described to (unintentionally) fit this category as well. For example, Löwgren [25] describes, within the context of aesthetics of interaction, how an experience with a cash machine (ATM) is articulated as a story in the user's mind through the build-up and release of tension. He describes how dramatic tension is built while the machine processes the PIN number, how other people in line behind the user can evoke fear of being robbed or anticipated shame for not having enough funds, and how the money and card finally being released from the machine brings relief. In a very simple way, the Anna G corkscrew [Fig 1] also fits this category, because the corkscrew is designed to first show the user the saintly figure that evokes certain associations, but later in the experience then the cork disappears underneath the woman's skirt from where the user needs to retrieve it. This contradiction evokes a time-based user experience that is structured as a narrative [13]. Products that evoke specific emotions over time also fall in this category. For example, the user of the On-edge Lamp (from Grimaldi's Ta-Da

series) [Fig 6] is meant to discover certain surprising findings in a particular sequence to increase the memorability of the object: the designer intended the lamp, which references the form and material of glass lamps, to sit on the edge of the table, so as to appear in a position of danger and activate a gut reaction in the viewer to want to move it onto the table. This has two effects – when the lamp is fully on the table it shuts itself off, revealing that it is meant to be on the edge, and also by touching the lamp the user realises that it is made of rubber, not glass, and is hence not as delicate as it appeared [20].

Figure 6. The On-Edge Lamp by Silvia Grimaldi

NARRATIVE FUNCTIONS IN DESIGN
The typology above shows in what ways narratives are used in design. It permits a certain classification about where and how narratives occur, who is the intended audience for the narrative, who is the creator of the narrative (the user or the designer) and whether this narrative is implicit in the interaction experience or is explicit, such as an accompanying narrative.

These are all characteristics that describe *how* narratives are employed in design. Another fundamental aspect related to this direction is the ultimate function or goal of narrative; *why* a narrative is included in design or the design process, and what the narrative ultimately *does* or *accomplishes* in its intended audience. The classification in Table 3 discusses seven different functions that narratives can serve, all of which are apparent when used in design or the design process. For each narrative function, an example related to the design process is discussed as well as an example related to the user-product experience.

Table 3 was created by assessing in a couple dozen examples of narrative use in design what their specific function(s) were, such as: 'the narrative helps the designer understand what these users would do in a situation like this', 'the narrative helps the designer to remember what the abilities of this user group are', 'the narrative in this ad gives the user a richer experience with the product', etc. These specific functions were subsequently grouped into the seven clusters of Table 3, according to their functional similarity.

It should be apparent that most narratives fulfil more than one function at a time – which is one of the reasons that they are so effective on different levels. Some of these functions, such as *memorability* and *teaching values*, have been used for millennia, for instance by myths, biblical tales and fairy tales. For example, the aforementioned tale of the ant and the grasshopper teaches a value (diligence), conveys this value tenably more effectively than a written rule (e.g., 'thou shalt be diligent'), is easy to remember, makes the user reflect on their own behaviour ('am I more like the grasshopper or the ant?') and is a delight to hear and tell, which is one of the reasons we still know it today – more than two millennia after it was conceived. Nevertheless, some narratives are not able to or do not aim to fulfil all these functions, so it is helpful to keep track of each function individually. This is apparent when analysing some of the examples from the typology of narrative use from the perspective of their narrative functions. For example, Dunne and Raby's Nipple Chair [Fig 2] stimulates

people to think about the cultural implications of electromagnetic fields in the home [11], which highlights certain values and makes the user reflect on the issues, but does not convey information, or induce empathy or creativity. Similarly, the narratives implicit in Alessi's Anna G [Fig 1], or in Grimaldi's On-Edge Lamp [Fig 6] are meant to delight and to increase memorability, but do not aim to teach values or elicit empathy [20]. Narrative elements in the design process often aim to evoke creativity in the designer or in the team, such as with Gaver's ambiguity technique mentioned above [14]. But these goals might also be combined, for example in Studio Weave's Freya's Cabin [Fig 4], the narrative is used to foster creativity, but also as a way of conveying information about the project, because it helps to explain the design to the public and to the construction team, and also delighting and creating a memorable experience.

Obviously, a designed product may also be appealing, memorable, and so forth, for reasons other than the
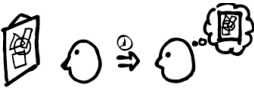
Narrative function	Example of function in design process	Example of function in product use
NF1 Conveying information	Designers and researchers use narratives to communicate insights more clearly and effectively, for instance in persona stories, context stories, or stories about current product use. [24] [9]	Narratives can be used to communicate to users about how they can use their products, for instance in usage scenarios. [35]
NF2 Evoking reflectivity	User or product narratives that involve an unusual situation or some kind of conflict can be used by designers to highlight design problems or cultural issues. [40]	In critical design, narratives are used to make users reflect on the role of products and technology in their lives. [11]
NF3 Showing/ teaching values	Narratives can be used in the design process to show certain do's and don'ts of user-product interaction, for instance in horror stories of past products.	Narratives, such as those used by movements like cradle-to-cradle or modernism, can be used to convey the ideological purposes of the products they set forth.
NF4 Empathy & Identification	User or persona narratives are often used to achieve a greater empathy with real users than could be obtained with target group data [38] [8].	Personal narratives that a user attaches to an object, for instance its history, or who they received it from, can greatly increase the perceived value of the object.
NF5 Imagination & Creativity	Narratives can be used by designers to spark imagination and increase creativity [31] [15].	Product narratives can inspire users to new ways of using the products, or even new ways of fitting the products in their lives.
NF6 Memorability	User insights that take the form of a narrative are easier to remember than facts or bullet points.	Narratives attached to or created through a product increase the memorability of product experience, and increase word of mouth [35] [13].
NF7 Delighting	Narratives that not just inform but also delight, increase the chance to be used frequently and effectively by the design team.	Narratives, either as part of a product or external to it, can enrich the user experience [20].

Table 3 Different functions of narratives with examples of their use in the design process and in product use

narrative it involves, but such qualities are not part of the categorization of narrative function.

RELATIONSHIP BETWEEN THE DEFINITIONS, TYPOLOGY AND FUNCTIONS

The three categorizations in this paper, which show (a) what types of narratives occur in design, (b) where narratives manifest in design, and (c) why narratives are used in design, can also be cross-analysed to better understand which kinds of narratives occur where, and which function they fulfil in each case.

Reflecting on the use of narratives in the design process, from the perspective of the five different definitions D1-D5, it seems that D3, *Logically Sequenced Narrative*, is used most explicitly: simple narratives that feature real users or personas (characters) and actions (agency), as well as events and their causes (causality). D2 *Sequenced Narratives* might be used for more neutral accounts of events, for instance in reports of usability tests that state the sequence of events a certain user went through. D4 *Value Laden Narratives* are often used in the design process, for instance when an anecdote is included of how a similar product might have horribly failed in the past. However, such accounts seem to be used less frequently than D3 narratives, perhaps because it is unfeasible or undesirable to include values and emotions in each product or user insight story. D5 *Entertainment Narratives* are usually left to professional writers, and are thus, to our knowledge, nearly never included in a design process. D1 *Minimal Narratives* are so broadly defined that it is probably of little use to designers or design researchers to consider them.

In user-product interaction, the kinds of narratives that are put into a product or that accompany a product are mostly in the D3-D4 range, as is apparent from aforementioned examples like the marketing narratives or the modernist narrative. D5 narratives are certainly used in intricate marketing campaigns for products; however this genre has not seen much application in product experience itself, apart from obvious examples like video games and other entertainment products with an elaborate narrative.

By comparing the different points of view of narrative definitions, typologies of use, and goals and functions of narrative, we aim to provide some insight into what elements designers can use at different stages of the design process to create different effects. For example, narratives in Category 3.2 (*Design structures the user experience over time as a narrative*) can be enriched by the elements of a *logically sequenced narrative* (D3): the designer could incorporate (perceived) causal links between the events that make up the product experience. These are of particular interest when a designer wants the product to have an understandable or logical narrative for increased usability (NF1); these may be particularly relevant to Categories 1.2 (*design facilitates in-the-moment story imagining in the user*) and 3.1 (*design is accompanied by a narrative external to the object*). Furthermore, these links might be

relevant when the designer wants to *evoke reflectivity* (NF2), because the user will be prompted to reflect on the connections between the different events, and to come to conclusions as to why the designer made particular choices, thus encouraging a form of dialogue with the artefact or with the designer through the artefact.

Value-laden narratives (D4) can be analysed in terms of how the narrative contributes to delivering a message (NF3); this can be linked to several of the categories from the typology. For example, in designs that are experienced with an accompanying narrative (Category 3.1), a value-laden overarching narrative sometimes frames the product; by communicating a value common to all organic products, for instance, the organic milk product is framed in this accompanying narrative.

Entertainment narratives (D5) tend to be more complex and specific to the medium, but they can still lend clues to aid in the design process. For example, conflict and climax are important elements in the construction of film and theatre narratives, and these could be incorporated into the design process or in the designed artefact. Some examples of this type of application can be seen in the type of installations and design interventions detailed in Löwgren [25] in which he analyses experiences with designed environments and objects in terms of rhythm and dramaturgical structure. Elements such as agency of objects, conflict, climax, and causal links can be incorporated into the design of the experience to create a rich narrative which may *facilitate story imagining in the user* (Category 1.2) in order to *delight the user* (NF7) or to stimulate more imaginative product uses (NF5). An example of such a project in progress is Grimaldi's Cinematic Narratives project [19].

DISCUSSION

The goal of this paper is to lay groundwork for a considered approach of the use of narrative in design; although narratives are already used in many areas of design for different purposes, there are no approaches or frameworks to describe these uses, which makes it difficult for designers to communicate about the topic or to engage with those elements of narrative theory that might enrich their design process or design work. In this paper we created a common frame of knowledge around narrative use in design, by considering *what* narratives are in definitions from narrative theory, by analysing *how* narratives are used in the design process and designed artefacts, and by looking at *why* designers might want to use narrative in their work. This framework aims to be a starting point in developing a methodology of narrative use in design which could be used by designers as a generative tool, and by researchers as an analytical tool in understanding and categorizing design work.

Sometimes, when the idea of narrative is used in design it is used to assess whether something *is* or *is not* a narrative; however from our analysis of definitions of narrative this becomes less relevant. If minimum narrative is broadly

defined as a sequence of events told or interpreted by someone, any experience could be described or analysed as a narrative. However, it is more interesting for designers to use the framework to analyse which narrative elements are present in their design and which could be added or subtracted to the narrative implicit or explicit in the design to make it a more engaging, meaningful, memorable, rich narrative.

Each section of this paper takes a different perspective. The definitions section can suggest narrative elements to be considered in the design process. The typology can prompt designers to

a. analyse and consider how narrative elements might be applied and when, focusing on the time-based aspects of the user's interaction
b. where the narrative is located, whether within the object, through the object's agency, or externally to the object as an accompanying narrative or in the user's experience in terms of the way the user interprets the experience or in the designer's experience of the design process.
c. The functions can prompt designers to reflect on what effects this particular narrative may have on the user or the design process.

This process of analysis and addition and subtraction could be used within all stages of the design process, from analysing the narrative in scenarios of product use, for example, to using it as a tool to generate ideas to refining a concept in a development phase.

FUTURE WORK
There are several areas that arise from this study as possible developments for this approach to design. The authors are interested in the idea of applying elements from the area of entertainment narratives (D5), for instance by introducing conflict and resolution or a climax to events, to structure the user's experience of an artefact, as well as the idea of using narrative theory as a guide to developing explicit narratives such as product characters. Some of the projects that lead on from this study are:

a. Investigating through design practice how the introduction of elements from film can enrich the user's narrative interpretation of a product, thus increasing the gusto in retelling and remembering the product interaction experience [18].
b. Studying how narrative structures like suspense and conflict can enrich the user's emotional experience with products and services. [12]
c. Analysing how subjective stories foster long-lasting relations and connectedness between a person and a design object from anticipation to appropriation. [30]
d. Investigating whether narrative elements always add to a design or whether they also subtract to the user experience; in other words, how much narrative is too much?
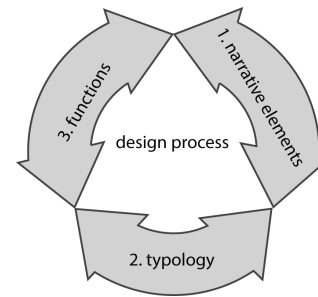
Figure 7: Three Step Narrative Design Process

The next step for this study will be to refine and develop the three step process outlined in this paper [Fig 7], looking at narrative elements, typology of narrative use, and functions of narrative in the design, into a toolbox that would be tested at workshops with design students as well as with design professionals. We are also interested in starting a discussion in the design community about the use of narratives within their design practice, research or teaching, and to this end we aim to assemble a database of design examples which could illustrate and expand the ideas about definitions, types and functions of narrative elements. To this end, we invite submissions of projects to this database.

REFERENCES
1. Abbott, H.P., 2008. *The Cambridge Introduction to Narrative*, Cambridge University Press.

2. Aristotle. 1987 *The Poetics of Aristotle*: Translation and Commentary. London: Duckworth.

3. Bal, M., 1997. *Narratology: Introduction to the Theory of Narrative*, 2nd ed. ed. University of Toronto Press, Toronto.

4. Bordwell, D., 1985. *Narration in the Fiction Film*. Univ of Wisconsin Press.

5. Bruner, J., 1991. *The narrative construction of reality*. Critical inquiry 18, 1–21.

6. Chatman, S.B., 1978. *Story and Discourse: Narrative Structure in Fiction and Film*. Cornell University Press, Ithaca; London.

7. Crossley, M.L., 2002. Introducing Narrative Psychology. In *Narrative, Memory and Life Transitions*. University of Huddersfield, pp. 1–13.

8. Danko, S., 2006. Humanizing design through narrative inquiry. *Journal of Interior Design* 31, 10–28.

9. Dindler, C., and Iversen, O. S., 2007. Fictional Inquiry—design collaboration in a shared narrative space, *CoDesign*, vol. 3, no. 4, pp. 213–234.

10. Djajadiningrat, J.P., Gaver, W.W., Frens, J.W., 2000. Interaction Relabelling and Extreme Characters: Methods for Exploring Aesthetic Interactions, *DIS '00 Proceedings of the 3rd conference on Designing*

interactive systems: processes, practices, methods, and techniques pp. 66–71, 2000.

11. Dunne, A., 2008. *Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design*. The MIT Press.

12. Fokkinga, S.F. and Desmet, P.M.A, 2012. Darker shades of joy: The role of negative emotion in rich product experiences. *Design Issues*. MIT Press. 28(4): 42-56

13. Forlizzi J., and Ford, S., 2000. The Building Blocks of Experience: An Early Framework for Interaction Designers, *DIS '00 Proceedings*, pp. 419 – 423

14. Gaver, W. W., Beaver, J. and Benford, S., Ambiguity as a resource for design, *Proceedings of the conference on Human factors in computing systems - CHI '03*, no. 5, p. 233, 2003.

15. Gaver, W., Boucher, A., Pennington, S. and Walker, B., 2004. Cultural Probes and the Value of Uncertainty, *Interactions,* vol. XI, pp. 53–56.

16. Genette, G., 1980. *Narrative discourse*. Cornell University Press.

17. Glenn, J., Walker, R. (Eds.), 2012. *Significant Objects*, Original. ed. Fantagraphics.

18. Grimaldi, S. (2013). Story of Use: Analysis of Film Narratives to Inform the Design of Object Interactions. In E. Brandt, P. Ehn, T. D. Johansson, M. Hellström Reimer, T. Markussen, & Anna Vallgårda (Eds.), *Nordes 2013: Experiments in design research Online proceedings* 9-12 June 2013 Copenhagen-Malmö.: www.nordes.org.

19. Grimaldi, S. 2012. Cinematic Narratives of Product Interaction Experiences, *Proceedings of 8th International Design and Emotion Conference* London 2012 Central Saint Martins College of Arts & Design, Edited by J. Brassett, P. Hekkert, G. Ludden, M. Malpass & J. McDonnell.

20. Grimaldi, S., 2008. The Ta-Da Series – A Technique for Generating Surprising Designs Based on Opposites and Gut Reactions, in: Desmet, P.M.A., Karlsson, J. van E. (Eds.), *Design and Emotion Moves*. Cambridge Scholars Publishing.

21. Herman, D., 2004. *Story Logic: Problems and Possibilities of Narrative*. Univ of Nebraska Pr.

22. Kearney, R., 2002. *On stories*. Routledge, London; New York.

23. Kurtzman. H., 2001. *The Grasshopper and the Ant*. Amherst, Mass.: Denis Kitchen Publishing.

24. Lloyd, P., 2000. Storytelling and the development of discourse in the engineering design process, *Design Studies*, Volume 21, Issue 4, pp. 357–373

25. Löwgren, J., 2009. Toward an articulation of interaction aesthetics. New Review of Hypermedia and Multimedia 15, 129–146.

26. Markussen, T., Özcan, E., Cila, N., 2012. Beyond metaphor in product use and interaction, *DeSForM 2012*

27. McKee, R., 1999. *Story: Substance, Structure, Style and the Principles of Screenwriting*. Methuen Publishing Ltd.

28. Miller, D. *Home Possession: Material culture behind closed doors*, Oxford: Berg, 2001

29. Nam, T., & Kim, C., 2011. Design by Tangible Stories: Enriching Interactive Everyday Products with Ludic Value. *International Journal of Design*, 2011 Apr 30.

30. Ocnarescu, I., 2012. An initial framework of aesthetic experience over time, Proceedings of *8th International Design and Emotion Conference* London 2012 Central Saint Martins College of Arts & Design, Edited by J. Brassett, P. Hekkert, G. Ludden, M. Malpass & J. McDonnell.

31. Parrish, P., 2006. Design as storytelling. *TechTrends* 50, 72–82.

32. Perrault, C., 1999. Little Red Riding Hood. *Perrault's Complete Fairy Tales*. Trans. A. E. Johnson. New York: Puffin Books, 66-69.

33. Portis, A. , 2007. *Not a Stick*, Ed. HarperCollins.

34. Propp, V. I. 1968. *Morphology of the Folktale*. University of Texas Press.

35. Steffen, D., 2009. Meaning and narration in product design, *DPPI '09 Proceedings*, pp. 1–9.

36. Tan, E. S., 1995.*Emotion and the Structure of Narrative Film: Film As An Emotion Machine*. Routledge.

37. Wright, P., McCarthy, J., 2010. *Experience-centered design: designers, users, and communities in dialogue*. Morgan & Claypool Publishers, San Rafael, Calif..

38. Wright, P., McCarthy, J., 2008. Empathy and experience in HCI, in: *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '08*. ACM, New York, NY, USA, pp. 637–646.

39. Young, K., Saver, J. F., 2001. The Neurology of Narrative, *SubStance*, Vol. 30, No. 1/2, Issue 94/95: Special Issue: On the Origin of Fictions: Interdisciplinary Perspectives, pp. 72-84.

40. Ypma, B. E., and Wiedmer, M., 2010. Fiction in Design Research, Report on the *6th Swiss Design Network Conference* in Basle