Exploring aesthetics through digital jewellery

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Abstract: We are on the verge of a digital era that needs an alternative for cultural standardization and the postmodern hype of styles, subcultures and social status. Several theorists have emphasized the importance of social-cultural context, sensorial perception, materiality and the mediating potential of products. We adopted a research through design approach to explore these aspects. We developed digital jewelry-concepts to support individuals who live in another country and culture than the one they grew up in. From that we extract lessons for the future development of wearables and make the case for a next aesthetics that pairs digital technology to ancient rituals, material qualities to sensorial abilities, practical function to intrinsic value.

Keywords: Aesthetics, digital jewellery, wearables, culture

1. Introduction

Aesthetics is an interesting field of study, as it simultaneously reflects and shapes the Zeitgeist. Twentieth century Modernism strived for a universal set of aesthetic rules. Yet in the end it couldn’t live up to its social intentions and was hollowed out by its own rigidity. Neither did Post-Modernisms hysteric emphasis on semiotics proof to be defensible on the long run.

What aesthetics would be suitable for our timeframe? In this paper we aim to address this question by reflecting on the results of a design exploration on digital jewellery in a multicultural context. Before going into depth about this design exploration, we shortly summarize the development of aesthetics as a field of study. Then we introduce the design exploration, elucidate the rational behind it and factually describe some of the outcomes. After that we discuss and frame the results and relate them to existing literature. We finish this paper by formulating some conclusions.

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2. Short history of aesthetics

German philosopher Alexander Gottlieb Baumgarten coined the term Aesthetics early 18th century. Aesthetics is deducted from Greek Aisthesis (sensory perception) and indicates the philosophical discipline that studies the broad field of sensorial perception. Baumgartens definition on the one hand fits into the rationalising tendency of The Enlightenment and on the other hand contradicts it by drawing attention to the sensorial as opposed to the ratio [1]. Baumgarten and later Kant created renewed attention for individual experience as opposed to science and philosophical rationalism: whereas rationalists would for example explore ‘color’ from the perspective of optics, aesthetics studies ‘color’ for its own sake [2:201].

Over time diverse interpretations of aesthetics have emerged in different fields of study [4:21]. This can partly be explained by the broadness of the original definition of Baumgarten. However, the different interpretations of aesthetics in art and design can actually be traced back to the emergence of these fields. By describing beauty as ‘Zweckmäßigkeit ohne Zweck’ Kant (1790/1963, Chapter 23, § 15) has excluded artefacts with a practical use (objektive Zweckmäßigkeit) from the domain of beauty. Next to that the field of industrial design emerged at the end of the 19th century as a result of the mechanisation. Within industrial design the focus on practical function culminated in 20th century modernism in which function dictated formal elements. Even though ornamentation is kept to a minimum, there is always a semiotic layer that on a symbolic level communicates about the lifestyle and believes of the product owner [8:328]. The interpretation of these signs might vary over time and between cultures. Post-modernism radically acknowledged the semiotic potential of products causing the balance between practical functionality and sign-value to flip in favour of the latter.

Aesthetics in design then has become a rather intellectual act, instead of a sensorial experience, as originally proposed by Baumgarten. In philosophical tradition attention for ‘the sensorial’ has been sustained. In recent years these works served as an inspiration for aesthetics in the field of industrial design [9]. In the context of this paper we would like to highlight the work of Shusterman [11]. In the pragmatic tradition of Dewey, he has developed the following set of aesthetic principals:

- the aesthetic combines intrinsic value with practical use
- aesthetics can not be understood without a social-cultural context
- form (understood as shape and movement) is tightly connected with aesthetical experience
- the study of aesthetics is as much a bodily as an intellectual act. ([11] as summarized by [9:56])

To summarize the above, we can say that each era develops a vision on aesthetics on the interfaces of past and future, object and user, form and function.
3. Towards a next aesthetics

In our opinion the best way to reflect on aesthetics is on the basis of artefacts in a concrete setting. In order to do so and taking the summary of the previous paragraph into account, we sought a context:

- that challenges the future, yet could as well draw inspiration from the past
- in which the materiality of the object is as central as the perceptual/sensorial skills of the user
- that balances practical function with semiotic value
- that taps into someone’s personality as well as into the broader social cultural context.

3.1 Design context

This context was found in the combination of jewellery and digital technology in a multicultural setting. Jewellery is a phenomenon that is common to all cultures and has not only great emotional potential but also cultural relevance. Although often regarded as merely adornment, jewellery functions as protection of the wearer and his/her beloved ones, as a memento of ones background and roots and as an indication of identity and social status of the wearer [12]. Due to the proximity to the human body there is a great emphasis on materiality that goes beyond the visual, also involving aspects like weight and tactility.

Over the last decennia digital technology has miniaturized: first becoming portable, then wearable. The possibility of adding a digital layer to jewellery forces us to rethink what jewellery could be and what this ‘digital jewellery’ could be like in terms of materiality, interaction and functionality. Many applications of wearable technology we have seen so far tend to be technology-driven and lack intimacy [15]. Therewith they seem to confirm the alienation and the loss of authenticity that the existential philosopher Jaspers blames technology for [13:22]. Contrary to that, we aim to explore if digital technology can add new functionalities to jewellery while simultaneously respecting, enlarging or emphasizing its traditional personal and social cultural values.

To further focus the design exploration we chose as our user group people who long-term live in a culture, other than the one they grew up in. The confrontation between cultures is one of the biggest challenges of our time. We do not want to be as pretentious to claim that design can single handedly solve this. Yet, we do believe that design can (and should) contribute. This requires an integer and equal relation from human-to-human. We do not focus on ‘the refugee’ that we are often confronted with in the media. Instead we engaged with individuals from another culture and design a dedicated piece of digital jewellery for him/her. No matter whether they came here for safety, economical, educational or amorous reasons.
Figure 1 visualises the chosen context. This figure places a visualisation of digital jewellery by Versteeg, Hummels and v.d. Hoven [14] within the so-called onion diagram of cultural manifestation by Hofstede, Hofstede and Minkov [5:8]. From a cultural perspective jewellery falls within the outer shell: symbols. Symbols are for example ‘words, gestures, pictures, or objects that carry a particular meaning that is recognized as such only by those who share the culture. […] New symbols are easily developed and old ones disappear; symbols from one cultural group are regularly copied by others. This is why symbols have been put into the outer, most superficial layer’ [5:8]. Closer to the core we find rituals. ‘Rituals are collective activities that are technically superfluous to reach desired ends but that, within a culture, are considered socially essential. They are therefore carried out for their own sake.’ [5:9] The interaction between jewellery and the wearer can take shape as a ritual, for example: praying the rosary. In the core of cultural manifestations we find values. Values are ‘broad tendencies to prefer certain states of affairs over others’[5:9]. Values are unawarely absorbed in the first 10 to 12 years of ones life and hard to be made explicit or influence afterwards.

Next to culture that we share with the group we live in, our behavior and preferences are shaped by our personality. Personality is partly inherited in ones genes and partly shaped through personal experiences [5:7].

3.2 Approach

In order to explore the constellation as sketched in the previous paragraph 43 Bachelor-level Industrial Design students at Eindhoven University of Technology were each asked to engage with an individual coming from another culture by means of an interview. Based on the interviews the students developed both an analogue and a digital piece of jewellery. As a preparation the students studied literature on culture differences [5] and jewellery [3,12]. Given the available time (140 hours per student) and their limited making-experience, the results might best be described as concepts, presented in text and physical prototypes. It was not feasible to create fully working prototypes due
to the time available, the size and complexity of the technology. However, to avoid the pitfall of making something too futuristic or technology-driven the students were stimulated to stick to technology that is commercially available. We used the student work as fuel for a reflection on the aesthetic interfaces as indicated at the end of paragraph 2: past and future, object and user, form and function.

4. Design Concepts

Before going to the reflection (described in paragraph 5), we’ll describe five digital jewellery concepts that will be used as illustrations in the remainder of this paper. They are first described individually and then schematised as a group.

4.1 Ritmo Amichevole by Milou Mertens

context: Ritmo Amichevole is designed for an Italian student, who studies abroad. Next to her family she misses her closest friends. Back home they used to have informal jam sessions, during which they shared their love for music and played together.

Concept: Ritmo Amichevole is a bracelet that enables wearers to exchange rhythms. When tapping on the one bracelet, the others start to vibrate in the same pace. The receivers can ‘answer’ by tapping their bracelets and therewith expand the melody. In terms of materiality Ritmo Amichevole is a simple leather bracelet.

Reflection; although music can be an expression of national culture, in this case it seems more the medium through which the friends express and consolidate their connectedness. The materiality of the bracelet doesn’t reveal its functionality, nor does it express much cultural value.
4.2 Daarja by Emma Disbergen

Context: each language has its own finesses that are often hard to grasp for non-native speakers. Next to that, tone of voice, loudness and intonation largely nuance the content of spoken text.

Concept: Brooch Daarja builds upon this. It was designed for a young Polish woman who lives in The Netherlands. On a daily basis she speaks Dutch, English and Polish. Throughout the day the brooch randomly records 30-second-fragments of conversation. When taken off, the brooch can be placed on a standard and will replay these fragments, yet not in their original languages, but in one of the other languages. Moreover persons who are dear to the wearer pronounce the texts: her mother the Polish, her Dutch tutor the Dutch and a friend the English fragments. Daarja is supposed to stimulate the wearer’s memory and trigger a sense of reflection. The abstract shape of the brooch portrays the wearer ‘floating’ between cultures. The wider shape symbolises the more open Dutch culture.

Reflection: In this concept language plays a crucial role as a cultural symbol. As much as it is about the content of the messages itself, it is about what can and cannot be said and the way things are phrased.
4.3 Tancia by Rowan Verbraak

context: Third Culture Kids (TCK) is the name for children whose parents come from diverse cultural backgrounds and who themselves grow up in one (or more) other culture(s). On the one hand this often leads to great adaptability on the other hand TCK’s often encounter psychological problems as they miss a feeling of belonging and have difficulties with engaging in long-term relationships.

Concept: Tanzia was designed for a woman in her early twenties who was born in Taiwan from a Taiwanese father and a Bolivian mother and grew up in The Netherlands as of the age of 12. Nowadays her parents are living in Taiwan, her family from mothers side is living in Malaga and she has a Portuguese boyfriend. Rowan Verbraak designed a pendant that dynamically visualises the relative distance to her loved ones, making use of the mathematical principal of voronoi diagrams. Although they are geographically separated, they are always connected and effecting each other.

Reflection: The chosen materiality of this concept is rather modernistic and doesn’t hold much reference to any national cultural.
4.4 In the bubble by Mette d’Hond

context: When one of your parents comes from abroad, you’ll inevitably absorb elements of the culture he or she originates from. Be it through stories, habits or family visits. In the case of the youngster who ‘In the bubble’ was designed for, his father was born in Ghana. Through visits he got to know the homeland of his father and came to especially appreciate the prevailing laidback atmosphere. During the scarce 10-minute-in-between moments of his hectic western life he often longs for this atmosphere.

Concept: Medallion In the bubble anticipates these moments. When opening the locket, Ghanaian music or sounds will start to play; how far the locket is opened determines what fragment is played. This way the locket is supposed to take its owner mentally to the more relaxed parallel world of Ghana. In terms of materiality Mette d’Hond has chosen for an organic shape that is reminiscent of a kernel executed in natural materials that are often used by Ghanaian artists and craftsmen.

![Image of Medallion In the bubble by Mette d’Hond](image)

4.5 A l’Est by Anouk Dijkman

context: Moving to another country requires you to relate to a new culture, trying to understand it and integrate into it. When you then get kids, they’ll naturally absorb this culture. They might actually be a catalyst for your own integration. However you also want to feed them with elements of your own background. It is this challenge that the lady from Tibet, who ‘A l’Est’ was designed for, is confronted with. The difference between her nomadic youth and the youth of her children, who’ll grow up in Amsterdam, couldn’t be larger.

Concept: A l’Est is a necklace that invites the children to tactiley and auditively recreate the environment their mother grew up in. Young children are often carried on the breast of their mother - in Tibet more so than in western cultures – and tend to play with jewellery that is within their reach. The shape of the silver elements on the necklace subtly refers to Tibetan mountains. The inside is covered with pure sheep wool. When flipping an element a soft sound of Tibetan nature starts to play, for example a singing bird or a splashing creek. Each element that is turned around adds an extra layer to the soundscape.

The name, A l’Est, is deduced from the French expression ‘être à l’ouest’ meaning ‘day-dreaming’. In a way the goal of the necklace is to let the thoughts of the wearer wander towards Tibet. However seen from a European perspective Tibet is not ‘à l’ouest’, yet ‘à l’est’. Moreover the name is an
anagram of the name of the wearer. Why does a Dutch designer give a French name to a design for a Tibetan woman? That is because she spent part of her youth in France.

Reflection: On first sight this might seem trivial information, yet on the contrary it reveals the determinative influence of the background of a designer.

4.6 Application of technology

Before discussing what we can learn from the combination jewellery, technology and culture, we will zoom in on the way the proposed concepts employ electronics. An intelligent system can basically be described as a system that collects data by means of sensor technology (input), processes these data by means of microcontroller (throughput) and is actuated based on the processed data (output).

Figure 7  Digital jewellery concepts modelled as input-throughput-output system

Figure 6 shows an analysis of the previously described concepts as input-throughput-output-systems. Each of the previously described concepts is represented by a line from left to right. In practice the lines are usually loops, as the wearer will give new input based on the output of the previous loop. For example: when flipping the one element of ‘A l’est’ resulted in the sound of bleating sheep, it is tempting to turn the next element. The figure concentrates on the day-to-day use of the concepts; we need to be aware though that ‘In the bubble’ and ‘A l’est’ will have had an initial loop to record the sounds of respectively Ghana and Tibet.

Looking at the input we have to distinguish between action and data. An action causes data to start flowing. The data can either be pre-collected or created through that very action (Ritmo Amichevole). Within the pre-collected data we need to distinguish between static and dynamic. Static data is collected once and doesn’t change anymore (‘In the bubble’ and ‘A l’est’), whereas dynamic data is constantly or regularly updated (Daarja and Tancia).

When it comes to throughput we see relatively simple operations. ‘Playback’ means releasing data on another moment than it was created. ‘Transfer’ means releasing data at another geographical location than where it was created. ‘Render’ means releasing data in another form than it was created in. In other words: the main focus of these operations is respectively shifting in time, space...
and medium. ‘Link’ is a more complex operation as it combines several inputs (the geographical location of different persons) into a visual representation.

Except for ‘Ritmo Amichevole’ all concepts collect input from the environment and create output that is primarily directed to the wearer.

5. Reflections

As figure 1 shows digital jewellery combines an analogue physical layer, with a digital virtual layer. The physical layer implies a certain materiality, which requires techniques to handle the material and sources to extract the raw material from. Traditionally both techniques (craftsmanship) and material sources tend to have a local character and can be seen as cultural expressions. The digital layer on the other hand is associated with uniform technology and a focus on functionality. Technology might be universal and impersonal, yet the digital data created with it, can be rather personal. Can we then expect that the physical layer of digital jewellery expresses cultural values, whereas the digital layer holds personal values?

Table 1. Cultural and personal values in the digital jewellery design concepts

| Design Concept | Physical Layer | Digital Layer |
|----------------|----------------|---------------|
| Ritmo Amichevole | neither | personal |
| Daarja | cultural | cultural & personal |
| In the Bubble | cultural | cultural & personal |
| Tancia | neither | personal |
| A l’est | cultural | cultural & personal |

Looking at the presented design explorations (table X) it doesn’t seem to be that straightforward. We found cultural value in both the physical and the digital layer. Personal value is by design limited to the digital layer, which by the way doesn’t mean that personal attachment with the object couldn’t emerge over time.

Another topic is how the analogue and the digital layer are connected. Intuitively one might expect them to be inseparable. Yet, why would – for example – changing the material of ‘In the Bubble’ influence its digital layer? Or, on a more abstract level: could changing the physical layer be used to adapt digital jewellery to personal taste or a specific culture? If so, would ‘In the Bubble’ be evenly suitable for a Dutchman living in Australia if it was made of typically Dutch Delft Blue ceramic?

We suppose it is subtler than that. The physical and the digital layer are tied together in the interaction: handling the object triggers action in the digital layer. For example, opening ‘In the bubble’ starts the playback of sounds from Ghana. If it opens too easily, it may open unintended. By further opening ‘In the bubble’ the next sound fragment starts to play. If it opens too smoothly, it may be complicated to find the position that corresponds with the next sound sample. A hinge that
allows for opening the locket in a staccato way, might be more suitable. These are examples on a rather functional level, however the analogue and digital layer are also connected on a more poetic level. The weight and texture of the shell for example communicate about its content: does it cherish or defend the content? Is the content of serious or playful nature? Etc. The design explorations described in this paper lack such a level of detailing. However we consider it to be an interesting direction of further research to try to connect the analogue and digital layer of digital jewellery by means of culturally rooted interaction scenarios.

6. Conclusion

This paper set out to explore next aesthetics through a design exploration of digital jewellery in a cultural context. Despite its small size, jewellery appeared to be an interesting application, due to its proximity to the human body, its long-term use and the personal and cultural values it holds. As such the outcome of this exploration can be inspirational for the currently emerging field of wearables. Whereas current approaches to wearables are often technology-driven and function-focused, our exploration seeks to integrate softer aspects related to materiality, the human body, personal and cultural values.

We conceptualised Digital jewellery in a cultural context (figure 1), we developed a series of design-concepts of which 5 are described in this paper (paragraph 4.1), we reflected on them and indicated a direction of further research. The design-concepts are not meant, nor treated as universal solution, yet they serve as physical input for the reflection. From this we gained insight in:

- the way interaction can be the connection between the analogue and the digital layer within digital jewellery
- how interaction in a cultural context can become a ritual
- how the analogue layer of digital jewellery can relate to culture through technique (material and craftsmanship)
- how universal technology could gain personal relevance through the data that it processes
- how computing power is able to enlarge personal significance of digital data by means of relatively simple operations (playback, render, transfer and link)

On the basis of these insights we will further detail the design-concepts in cooperation with craftsmen and technologists. After that we plan to evaluate them in a longitudinal user study.

As described in paragraph 2, aesthetics develops on the interface of past and future, object and user, form and function. In contradiction to the past, where we have seen dogmatic focuses on certain of these aspects, our design exploration suggests to search for a next aesthetics that pairs ancient rituals to digital technology, material qualities to sensorial abilities, intrinsic value to practical function. A subtle balance is far more exciting, than the dictatorial extreme.

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