Designing an organizing system for tattoo art pieces (images) with faceted metadata

Type: Implementation

Tattoos are commonly known as body modifications using ink and needles to create art on a person's body. They have been around since ancient times and there is still a growing popularity for tattoos till date. Just like any other art, tattoos have evolved in their style and techniques making it subjective to the artist and the person getting tattooed. As this is a permanent change to someone's body, we are meticulous about what to get tattooed and how that will be perceived to the person getting tattooed as well as the others around them.

Today, there are millions of tattoo artists with different styles of their own that form a large collection of this type of information in the form of images. This implementation project presents a categorization system for these tattoo images or in my opinion, art pieces to make browsing and searching for tattoos more accessible for tattoo enthusiasts.

The project follows a category based approach by creating faceted metadata to make searching and retrieval of these images more successful for the users. Research has shown that most participants found a metadata approach more helpful and flexible to learn more about a collection than a standard baseline system. ()

Using a faceted metadata approach for this tattoo image search interface will make this pool of information about tattoos more consistent for the target audience, who are tattoo enthusiasts. Their information needs to learn and get inspired about different types of tattoos, styles are satisfied when they use this one-stop platform - where searching and retrieval of tattoos is quicker and easier by using textual category labels associated with the tattoos.

This system uses hierarchical faceted metadata to create conceptual dimensions which can be browsed by keyword searching of textual category labels, allows content-based image retrieval "to extract low-level visual properties" such as tattoo style, subject, color, line work etc. The purpose of using this approach is backed up by results from a study conducted by Rodden et al which suggested "that images organized by category labels were more understandable than those grouped by visual features."

Searching for tattoo images is very specific and a tedious task because there are so many images that can be found that are unorganized making it difficult for the user to understand what kind of tattoo they would like to get. So, having a structured information system about tattoos on a website will allow the users to interact with a consolidated organization of this information where they can learn about different tattoo styles as well as take an informed decision about the design of their tattoo. Along with this, this platform enables sharing of information and re-using it making it an efficient use of information as it needs can be transferred easily. As mentioned earlier, like any other art, tattoos and their styles change so quickly that having a category system with faceted metadata helps to keep track of updates and records as well as add in new styles smoothly.

To begin designing a categorization system, I first created a collection of resources that includes various styles of tattoos from sources like instagram, unsplash and pinterest to create an image database. During this search for images, I kept in mind different combinations of topical categories that could potentially be applied to this collection.

Looking at this collection of information, I then began to formulate the most appropriate metadata descriptors for these images. With a content-oriented categorization in mind, I began to create a set of categories that are used as facets for these metadata. The higher-level facets for these set of categories are as follows:

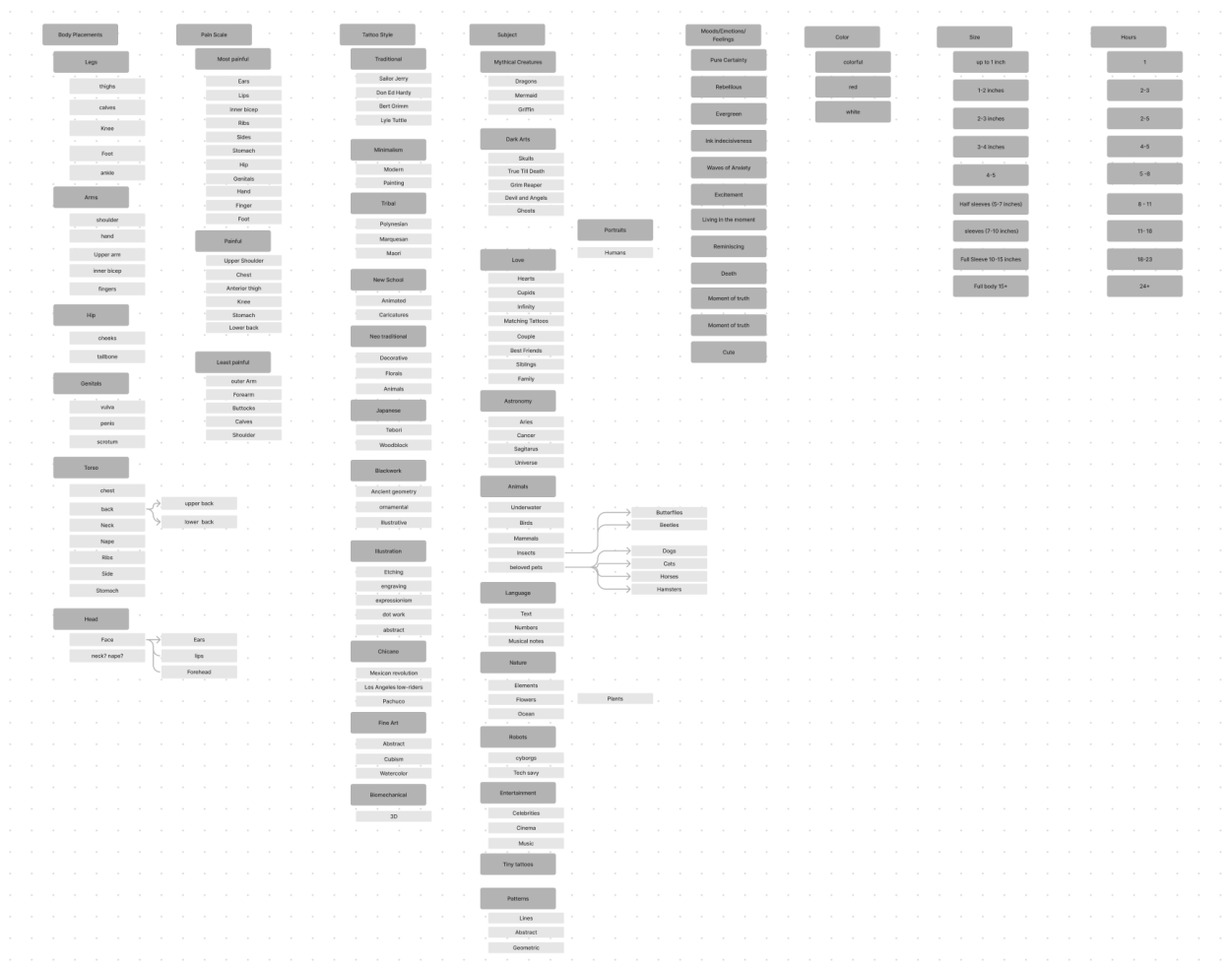**Hierarchical Category Facets :**
1. **Body Placements:** This became an important category to search for tattoo inspiration as it is an important factor to understand where on your body you would want to get tattooed. For a lot of users, there is a specific place where they wish to get tattooed and searching by this category can help them understand body placements of different kinds of tattoos. This also helps users to learn about places they can get tattooed if they currently have no information about how to make this decision
2. **Pain Scale:** Following the previous category and understanding that getting a tattoo is a painful process, it helps to organize images of tattoos with a scale of "Most Painful" to "Painful" to "Least Painful." This makes searching for tattoos easier for users that want to get their first tattoo that is least painful or if they are adrenaline junkies then most painful body parts for getting a tattoo.
3. **Tattoo Style:** Another important category of tattoos is their style. Categorizing images in these buckets helps the users to retrieve a particular style of their choice or learn more about the different kinds of styles to help them make an informed decision.
4. **Subject:** A lot of times users know exactly what they want to get tattooed and are looking for inspiration along those lines. This category helps them to drill down using faceted metadata to filter out exactly the kind of subject they want to get tattooed, for example: dragons or their beloved pet dog.

Flat Facets:
1. **Mood:** The most common question asked when getting a tattoo is: What does this mean to you? And as subjective as this can be, having a category for such a distinction is not useful for all the target audience. So, I designed a category called Mood, for users that know their feeling or emotion of getting the tattoo but don't know which one suits that particular need.
2. **Color:** Since most tattoos use black ink, this allows the users to search for colorful tattoos to satisfy a specific need for their style.
3. **Size:** For first-time tattoo getters, this is a good starting point to filter out the size of the tattoo on their body and so filtering by this type of metadata gives them specific results for inspiration.

Using these descriptions for this categorization system and analyzing the collection of the images, I began to create a set of hierarchical faceted metadata. Below is a image of the process of forming these deeper categories that use faceted metadata:

High-level view:

Zoomed into one category for reference:
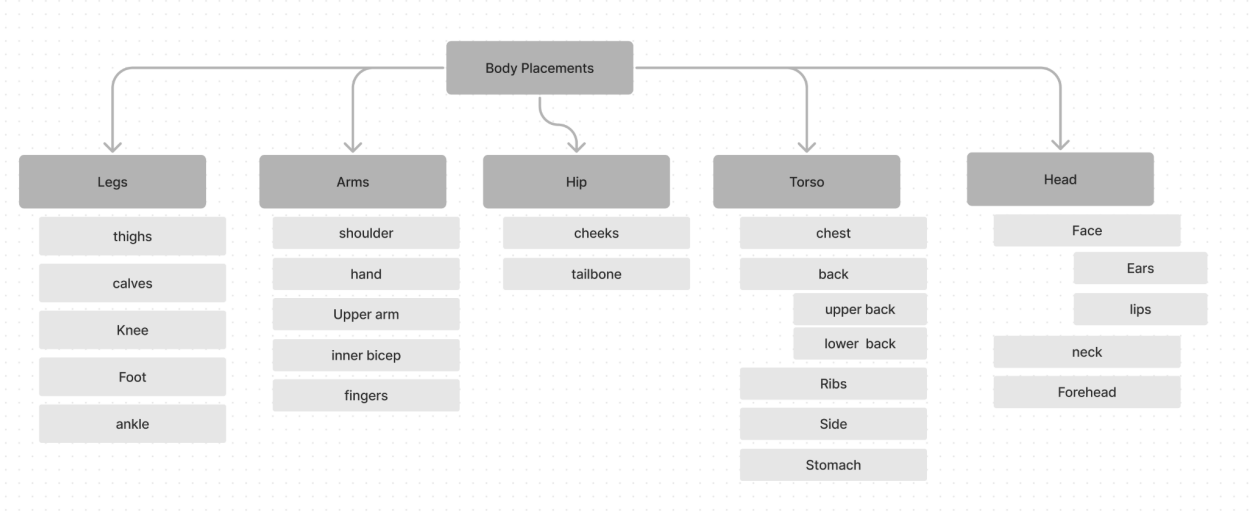
Along with these high-level facets, it was necessary to have flat metadata and hierarchical metadata to present search results that had these categories in common.

1. Flat/ Individual facets: Color → Red
2. Hierarchical metadata: Subject → Mythical Creatures → Dragons

This allows the images to have both single and multiple values as categorizing images solely based on their visual properties is hard, and some queries include keywords with multiple values for one particular tattoo. For example: the user might search to look for tattoos that are "red" and contain "dragons."

I chose these descriptor labels for facets with help of wordnet. Exploring different hyponyms and hypernyms of these properties helped to form facets with their higher-level categories that best fit the hierarchy of the faceted structure of different tattoo properties.

Designing this organizing system with faceted metadata helped to reduce the information load on the user when in this pool of tattoo imagery. The categorized system starts with a broad overview of the collection but also allows the user to see the metadata facet along with its top-level categories. This makes navigation easier and gives the user freedom to explore different search results based on their queries. The user can drill down on different aspects of their potential tattoo design by choosing facets that narrows down their search results.
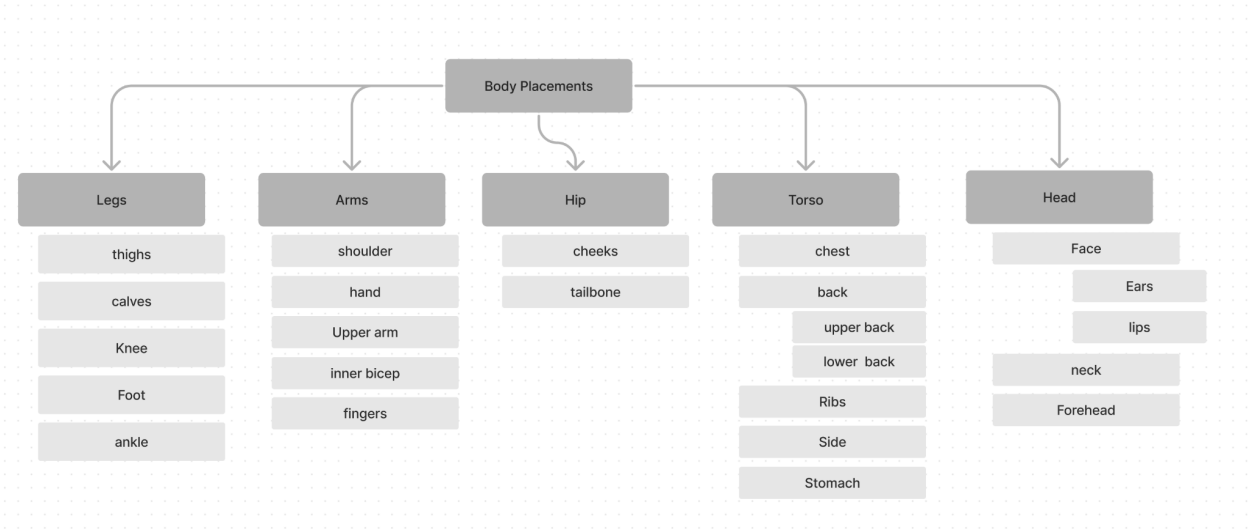For example, this makes it possible to search for tattoos that are:
1. **"Least painful"** with an **"illustrative"** tattoo style that can be placed on their **"calves"**.
2. **"Skulls"** within the size range of "**4-5 inches**" on their **"upper arm"** that uses **"blackwork"** style but more specifically "**geometry**"
3. Or a more generic query of tattoos are designed on their **"back"**

Using faceted metadata image search for this collection of tattoo images allows users to find context for their search within the metadata hierarchy, giving them the best suitable results. As each term that is typed in is associated with the metadata assigned to each image, it gives out a sorted result but also allows flexibility to change these metadata labels in their query to output a different result. The key aim of this organization is to help the users get their optimal search results to make a well-informed decision about their first or the 5th tattoo!
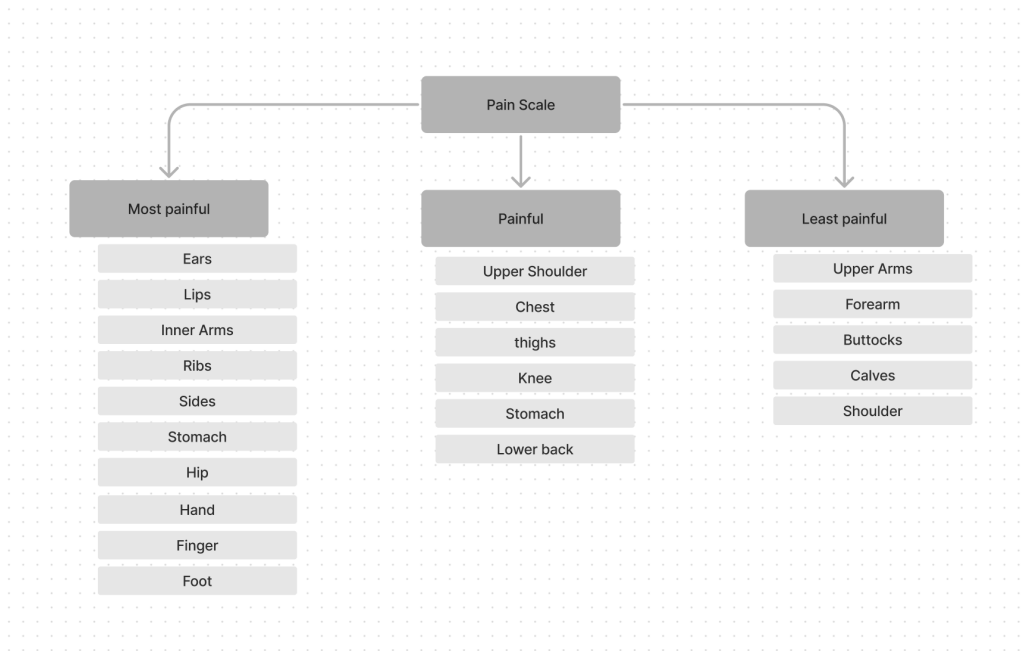
Appendix

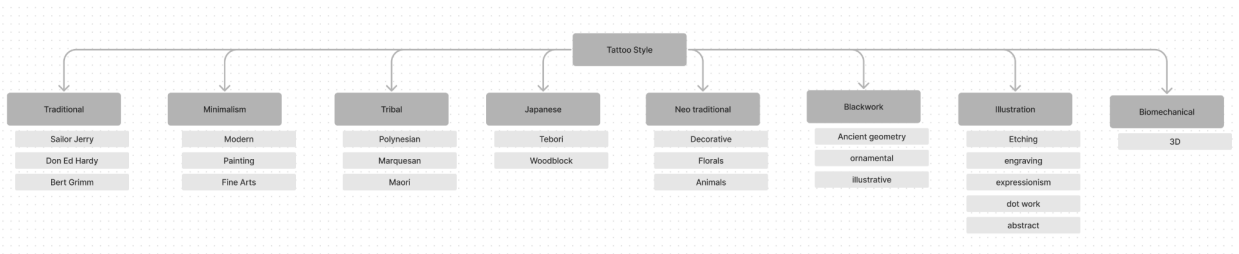All the categories of this organization system are below:
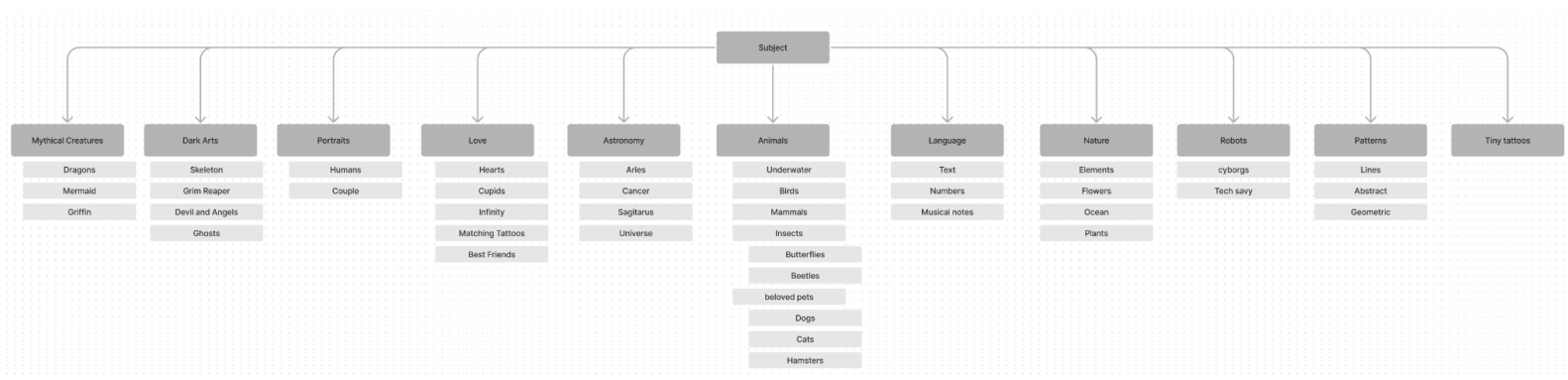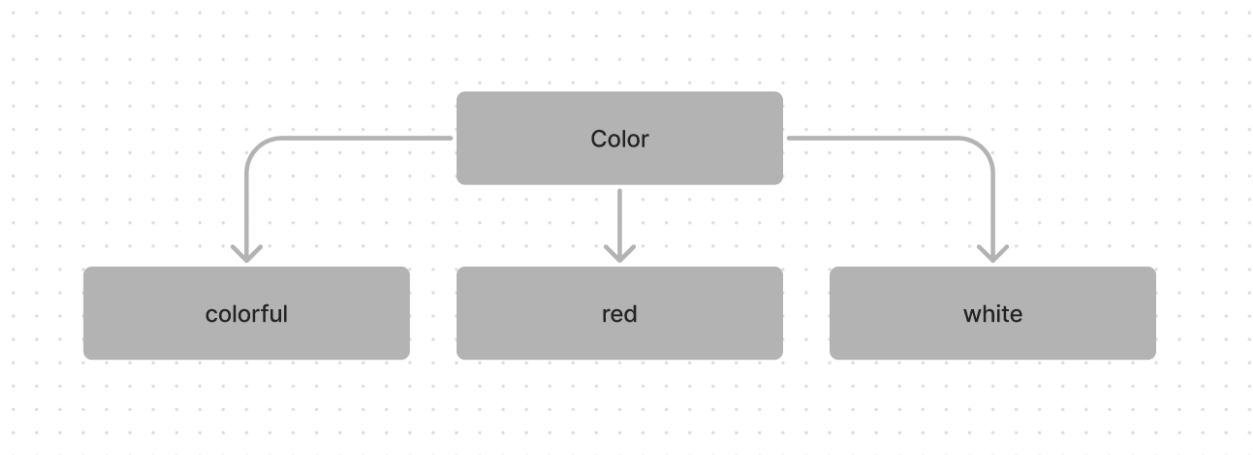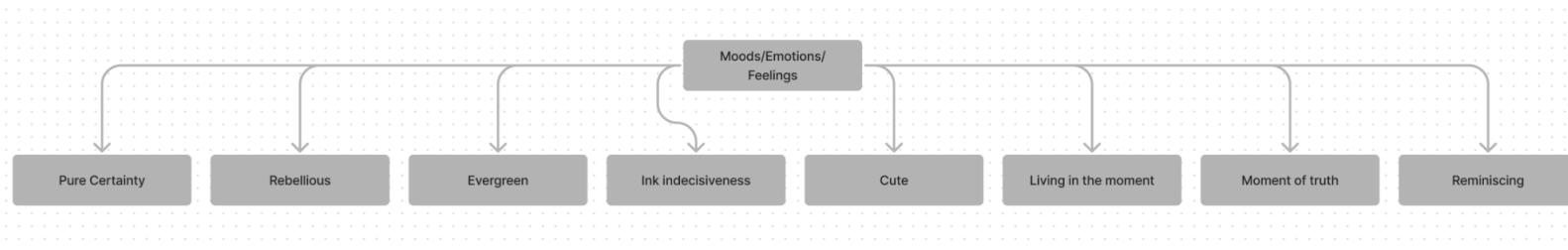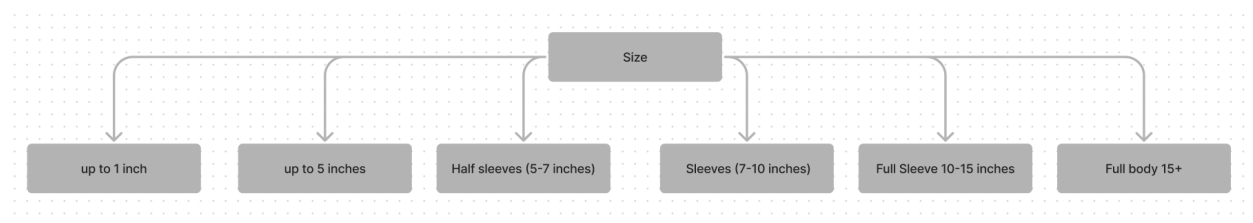
1. Body Placements

Body Placements

Legs	Arms	Hip	Torso	Head
thighs	shoulder	cheeks	chest	Face
calves	hand	tailbone	back	Ears
Knee	Upper arm		upper back	lips
Foot	inner bicep		lower back	neck
ankle	fingers		Ribs	Forehead
			Side	
			Stomach	

2. Pain Scale

Pain Scale

Most painful	Painful	Least painful
Ears	Upper Shoulder	Upper Arms
Lips	Chest	Forearm
Inner Arms	thighs	Buttocks
Ribs	Knee	Calves
Sides	Stomach	Shoulder
Stomach	Lower back	
Hip		
Hand		
Finger		
Foot		

3. Tattoo Style

Tattoo Style

Traditional	Minimalism	Tribal	Japanese	Neo traditional	Blackwork	Illustration	Biomechanical
Sailor Jerry	Modern	Polynesian	Tebori	Decorative	Ancient geometry	Etching	3D
Don Ed Hardy	Painting	Marquesan	Woodblock	Florals	ornamental	engraving	
Bert Grimm	Fine Arts	Maori		Animals	illustrative	expressionism	
						dot work	
						abstract	

4. Subject

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                                          Subject
   ┌──────┬──────┬──────┬──────┬──────────┬──────┬──────┬──────┬──────┐
Mythical    Dark     Portraits   Love   Astronomy  Animals  Language  Nature  Robots  Patterns  Tiny tattoos
Creatures   Arts
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Mythical Creatures	Dark Arts	Portraits	Love	Astronomy	Animals	Language	Nature	Robots	Patterns	Tiny tattoos
Dragons	Skeleton	Humans	Hearts	Aries	Underwater	Text	Elements	cyborgs	Lines	
Mermaid	Grim Reaper	Couple	Cupids	Cancer	Birds	Numbers	Flowers	Tech savy	Abstract	
Griffin	Devil and Angels		Infinity	Sagitarus	Mammals	Musical notes	Ocean		Geometric	
	Ghosts		Matching Tattoos	Universe	Insects		Plants			
			Best Friends		Butterflies					
					Beetles					
					beloved pets					
					Dogs					
					Cats					
					Hamsters					

4. Color

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                    Color
        ┌─────────────┼─────────────┐
     colorful        red          white
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5. Moods

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                      Moods/Emotions/
                         Feelings
   ┌──────┬──────┬──────┬──────┬──────┬──────┬──────┐
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Pure Certainty	Rebellious	Evergreen	Ink indecisiveness	Cute	Living in the moment	Moment of truth	Reminiscing

6. Size

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                         Size
   ┌──────┬──────┬──────┬──────┬──────┬──────┐
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up to 1 inch	up to 5 inches	Half sleeves (5-7 inches)	Sleeves (7-10 inches)	Full Sleeve 10-15 inches	Full body 15+

7. Website with categories: