



API-ecosystem for cross-sectorial exchange of 3D personal data

Report. Consumer Goods Survey

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<http://www.bodypass.eu/>



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1 Executive summary

BODYPASS aims to break barriers between health sector and consumer goods sector and eliminate the current data silos. The main objective of BODYPASS is to foster exchange, linking and re-use, as well as to integrate 3D data assets from the two sectors. For this, BODYPASS has to adapt and create tools that allow a secure exchange of information between data owners, companies and subjects (patients and customers).

3D personal data is type of data that contains useful information for product design, online sale services, medical research and patient follow-up.

Currently hospitals store and grow massive collections of 3D data that are not accessible by researchers, professionals and companies. About 2.7 petabytes a year stored in the EU26.

In parallel to the advances made in the health sector, new 3D body-surface scanning technology has been developed for the goods consumer sector, namely apparel, animation and art.

Moreover, new low-cost scanning technologies are expected to exponentially increase 3D data creation. It is estimated that currently one person is scanned every 15 minutes in the US and Europe. And increasing.

The 3D data of the health sector contains the body shape information, not only internal body information. These data could be used by designers and manufacturers of the consumer goods sector. At the same time, although 3D body-surface scanners have been developed primarily for the clothing industry, 3D scanners' low cost, non-invasive character, and ease of use make them appealing for widespread clinical applications and large-scale epidemiological surveys.

However, companies and professionals of the consumer goods sector cannot access the 3D data of health sector. And vice versa. Even exchanging information between data owners in the same sector is a big problem today. It is necessary to overcome problems related with data privacy and the processing of huge 3D datasets.

This report is the result of a survey addressed to the consumer goods sector. BODYPASS has to adapt and create tools that allow a secure exchange of information between data owners, companies and customers. The survey results will help us to define the needs of the end-users of BODYPASS results.

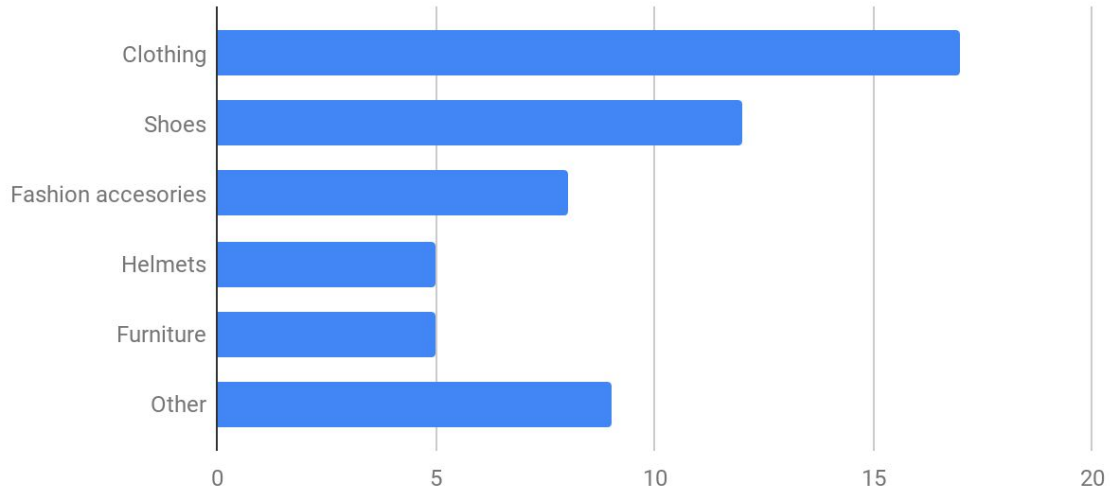
28 professionals from different companies have answered the questionnaire. Maybe the number might seem scarce. However, these professionals have a huge experience in the use and analysis of 3D data applied to consumer goods. Their answers are very relevant in order to define the major user's needs with regards BODYPASS project.

The report is divided in the sections below:

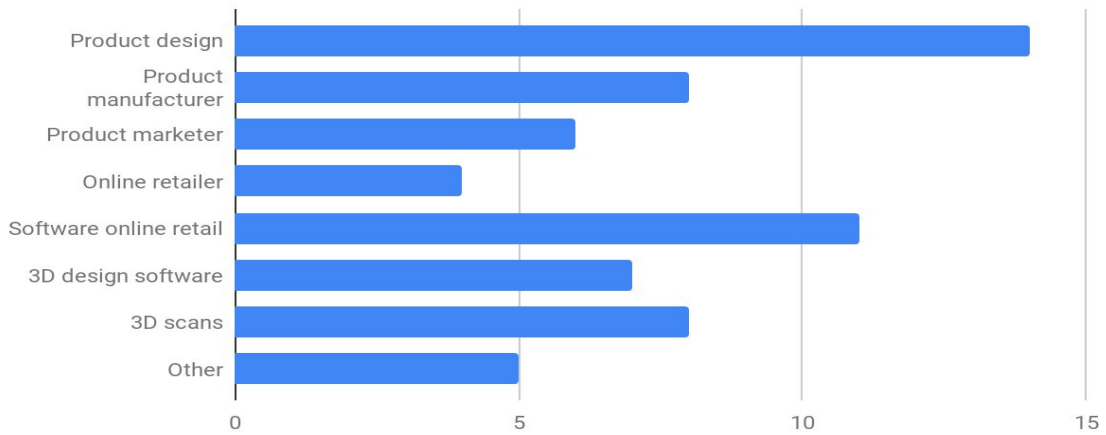
- **Classification.** The origin of the surveyed in order to classify them.
- **Needs.** The surveyed explained the reasons why they want access to 3D anthropometric data. The questions about individual data or aggregated data are analysed separately.
- **Data curation.** In the last section of the survey, we asked if the companies involved needed to store a large amount of 3D anthropometric data.

2 Classification

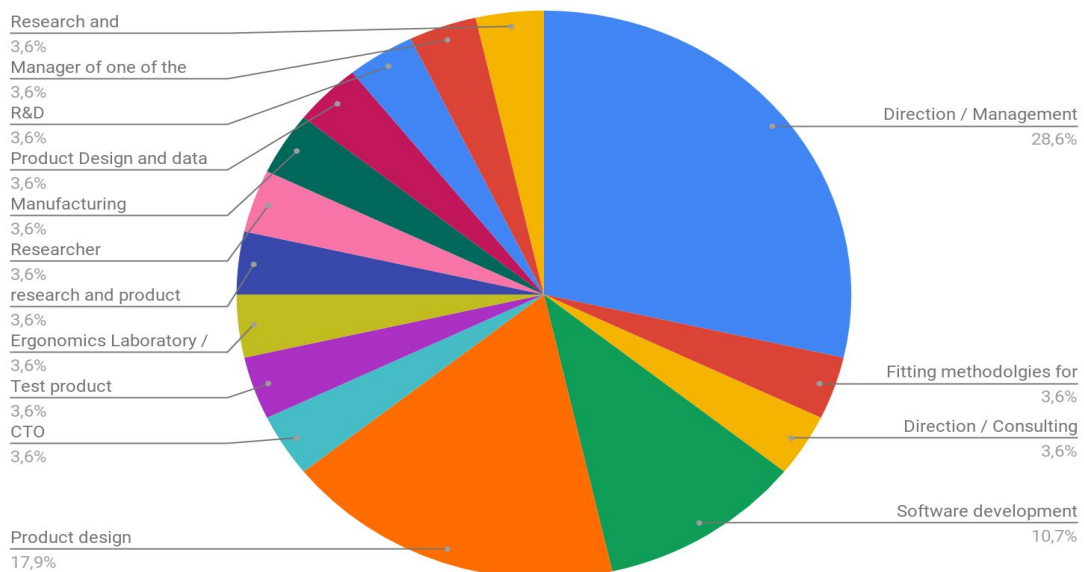
A. Relationship from the companies with the products



B. Activities from the companies which have completed the survey



C. Departments of the previous companies which have completed the survey



3 Needs of 3D Anthropometric Data

In the survey, the 96.4% of the surveyed need or process 3D anthropometric data. From those, the 88.9% want to use the information for Detection of needs and / or analysis of potential solutions.

The surveyed are interested in customising products related with the automated garment fit. Also they are involved in several R&D projects, so they will use the data to improve algorithms, bring closer the knowledge to the engineering world and basically sizing and shaping different groups of people.

The 96.3% of the surveyed want to use the data for product and/or service design, specifically to perform a more accurate personalization of the products and to fulfill the size and shape requirements for specific groups.

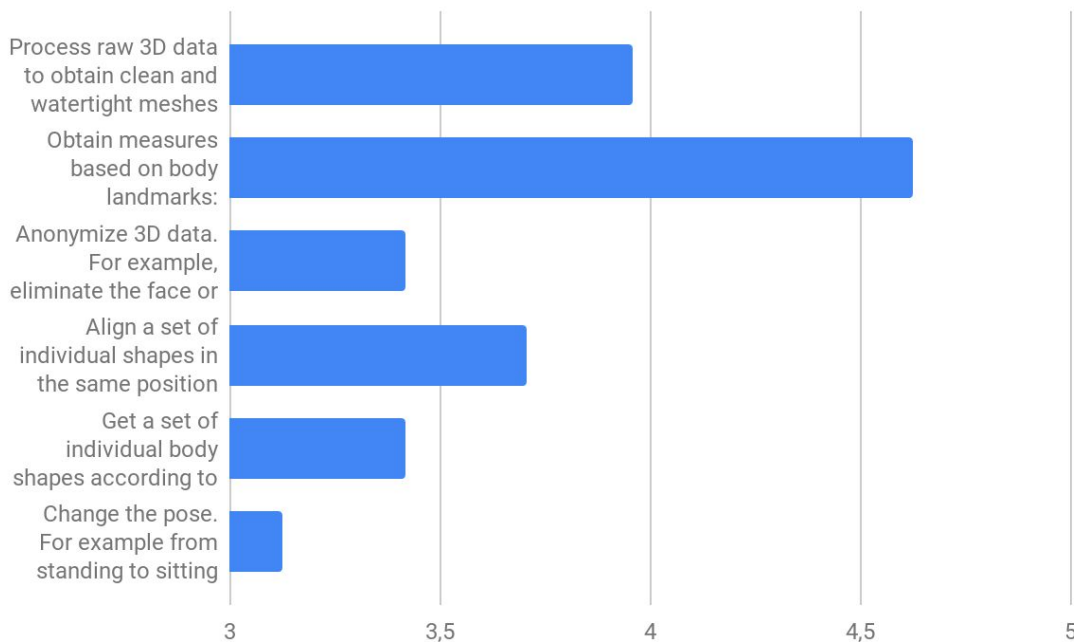
The 70.4% of the surveyed want to use the 3D data for product manufacturing. Above all, this percentage is focused on fabricating mockups and prototypes, as a part of the manufacturing process to adjust their products to the shape of the body.

In product sale, the percentages are different, only the 59.3% want to use the data for this purpose. The reasons are various and specific, the most common is to act as a support of e-commerce department, in order to improve product customization

The 66.7% of the surveyed want to use 3D data for after-sales services. Among the answers, the most common purpose is to correct some wrong customization or to complete the offerings of the company.

3.1 Individual Data

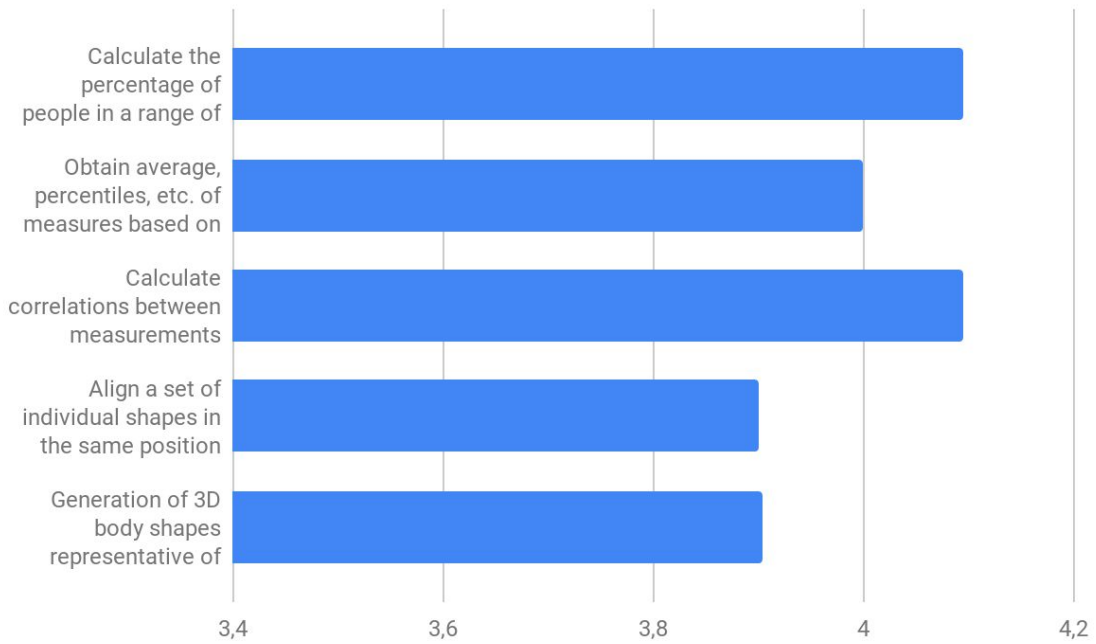
The 88.9% of the surveyed want to manage or use individual data type. Considering the needs, the degree of importance (from 1, not at all important, to 5, extremely important) that the following services have in relation to the treatment of 3D “individual” anthropometric data is presented in the next figure:



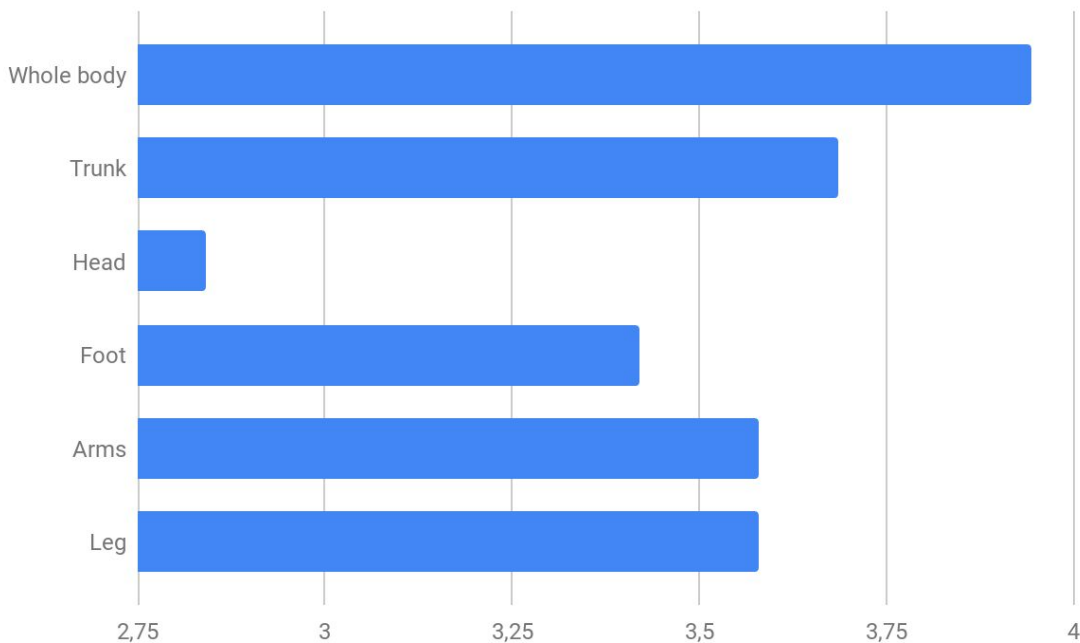
Among all surveyed, the most common other service required, related to 3D “individual” anthropometric data, is to access to raw measurements and scans. They directly want to use the raw data.

3.2 Aggregate Data

The 77.8% of the surveyed want to manage or use aggregate data type. Considering the needs, the degree of importance (from 1, not at all important, to 5, extremely important) that the services have in relation to the treatment of 3D “individual” anthropometric data is shown in the next figure:



On the other hand, in the same scale of importance, according to the generation of shapes that represents group of individuals, the surveyed stated the following priority:

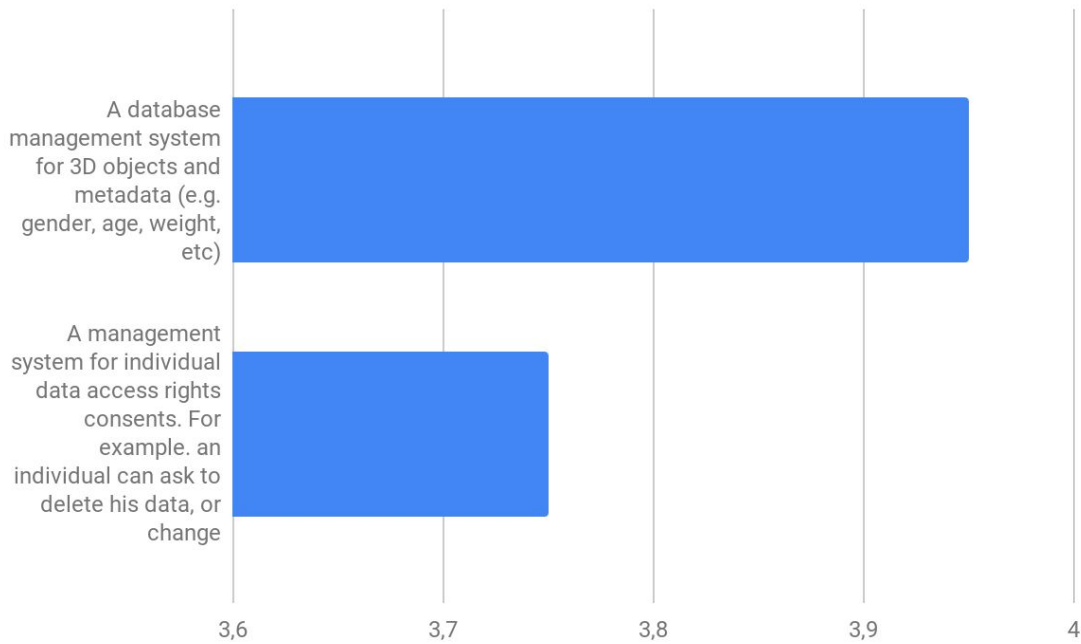


Also they asked for different body parts to be shown more segmented and for other different parts of the body as neck.

4 Data Curation

In the last section of the survey, we asked if the companies involved needed to store a large amount of 3D anthropometric data, The 74.1% of the surveyed answered yes.

In the same importance scale as above, they specified the degree of importance of the following services, the results are shown next:



As showed, a database management system for 3D objects and metadata is the most important.

5 Annex. Questionnaire

Classification

1. Type of products. Your company is involved in these products, or offer services to companies related with these products *

Tick all that apply.

- Clothing
- Shoes
- Fashion accessory (gloves, hat, ties, etc)
- Helmets
- Furniture
- Other: _____

2. B. The activity of your company is involved in *

Tick all that apply.

- Product design
- Product manufacturer
- Product marketer
- Online retailer
- Development of software supporting online retail (e.g. size/fit recommendation, virtual fit/try-on, etc.)
- Development of 3D design software (e.g. CAD)
- Development of of 3D body scanners or 3D reconstruction software
- Other: _____

3. Select your department or main role in your company *

Mark only one oval.

- Product design
- Manufacturing
- Direction / Management
- Commercial / Marketing
- Software development
- Other: _____

NEEDS OF 3D ANTHROPOMETRIC

4. Does your company need or process 3D anthropometric data? *

Mark only one oval.

Yes *Skip to question 6.*

No

5. Optional. You do not need or process 3D data. Why not?

Skip to question 27.

6. Do you want to use 3D data for Detection of needs and / or analysis of potential solutions? *

Mark only one oval.

Yes

No

7. Optional. Please explain how you would use 3D data, or why you do not want to use 3D data for Detection of needs and / or analysis of potential solutions

8. Do you want to use 3D data for product and / or service design? *

Mark only one oval.

Yes

No

9. Optional. Please explain how you would use 3D data, or why you do not want to use 3D data for for product and / or service design

10. Do you want to use 3D data for Product manufacturing? *

Mark only one oval.

- Yes
- No

11. Optional. Please explain how you would use 3D data, or why you do not want to use 3D data for product manufacturing

12. Do you want to use 3D data for Product sale? *

Mark only one oval.

- Yes
- No

13. Optional. Please explain how you would use 3D data, or why you do not want to use 3D data for Product sale

14. Do you want to use 3D data for for after-sales services? *

Mark only one oval.

- Yes
- No

15. Optional. Please explain how you would use 3D data, or why you do not want to use 3D data for after-sales services

Individual data

16. **Would you like to manage or use individual data type?. For example, the body shape of your customers ***

Mark only one oval.

- Yes
- No *Skip to question 19.*

17. **Considering your needs, specify the degree of importance that the following services have in relation to the treatment of 3D "individual" anthropometric data: ***

Mark only one oval per row.

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Process raw 3D data to obtain clean and watertight meshes that can be directly imported by 3D design software	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obtain measures based on body landmarks: perimeters, lengths, areas or volumes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anonymize 3D data. For example, eliminate the face or other parts that could be used to identify people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Align a set of individual shapes in the same position and orientation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get a set of individual body shapes according to some filters. It could be the complete body of some parts (head, foot, etc.). Filter example: sex, age, waist between A and B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change the pose. For example from standing to sitting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. **Optional. Do you wish other service related with 3D "individual" anthropometric data? Please explain**

Aggregate data

19. Do you would like to manage or use aggregate data type?. For example, the average body shape of specific group of people. *

Mark only one oval.

- Yes
- No Skip to question 24.

20. Considering your needs, specify the degree of importance that the following services have in relation to the treatment of 3D "individual" anthropometric data: *

Mark only one oval per row.

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Calculate the percentage of people in a range of measures. For example, the percentage of people who have a waist between A and B, a leg length between C and D.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obtain average, percentiles, etc. of measures based on body landmarks: perimeters, lengths, areas or volumes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Calculate correlations between measurements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Align a set of individual shapes in the same position and orientation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generation of 3D body shapes representative of specific groups of individuals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. Optional. Do you wish other service related with 3D "aggregate" anthropometric data? Please explain

22. With regards the generation of shapes that represent groups of individuals. Please specify the degree of importance that the following body parts have for you.

Mark only one oval per row.

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Whole body	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Head	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Foot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Arms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leg	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. Optional. Please, define other body parts important for you
