IO3029 Including social cohesion in product design

Report Case 3

Mobile Furniture



SEDG Pamoja

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This report shows the process Social-Entrepreneurial-Design-Group(SEDG) Pamoja has gone through to find a Community-Integrated-Product-System (CIPS).

This is the third of three reports concerning the social cohesion in slum villages, with no specific cultural context, in relation to the mobile furniture.

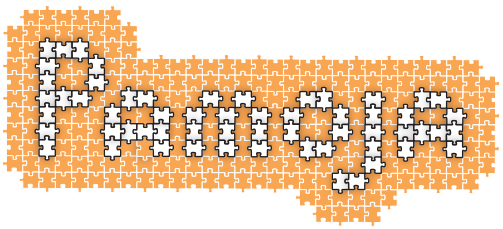
Each report includes the 3-I model: Identification, Integration and Implantation; and describes the relevant aspects within and around this method.

In short, in the Identification phase fields of opportunity will be generated to diverge. In the Integration phase the CIPS will be developed and in the last phase Implantation the CIPS will be implemented in the community. During this process a 3D board of the slum will be used to keep a good look at the community, its people and its structure.

This case is about the mobile furniture, which has to be developed into a concept. But what is much more important is the impact of this product on the community as a whole product system. The goal of the SEDG is to come up with a CIPS which has the desired influence on the social cohesion among the people of the imaginary slum village.

Pamoja hopes this report provides a clear image to the reader of the process and the results.

Social Entrepreneurial Design Group



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Phase 1 Identification

Case analysis

Technology

The concept for the third case is mobile furniture, that will make it easier for people to take a piece of furniture somewhere else, so it has functions in different settings/scenarios. It is important for this concept that it can be maneuvered easily on the roads and paths within the slum. Infrastructure here is very poor, so the product has to be suitable for a lot of different kinds of soil or paths.



Although most furniture is mobile, since it can be picked up by one or more persons and can then be carried somewhere, the challenge is to design te furniture in such a way, that the furniture invites people to move the furniture.

Usage

In the different scenarios described later in this report several ways of using the mobile furniture are found. In any case the concept has to create or increase the social cohesion among community members. This means that by using this product in some way the face-to-face contact, social capital and/or sense of belonging is improved. The specific users and usage will be defined later, when the final scenario has been chosen.

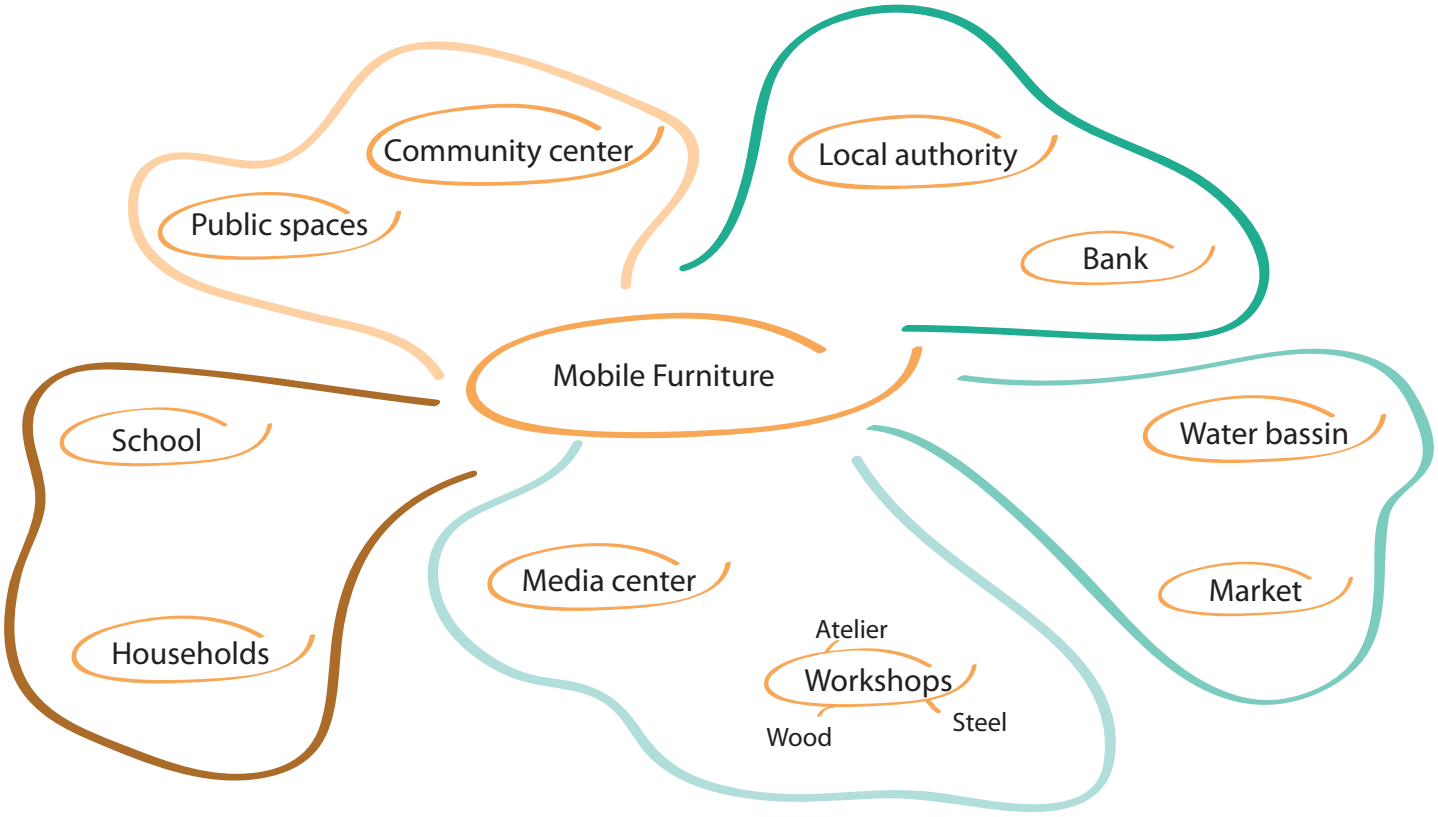
Ergonomics

The mobile furniture will probably be used by people of different ages. This will have consequences for dimensions like, the height of the product and its mass. It is also essential that the user does not have to make difficult poses while maneuvering the furniture through the slum.

Field of opportunities

Method

Just like in the first and second case, different sub-scenarios were created. Different elements of setting x were derived amongst the group members to each write some scenarios. These scenarios can be found in appendix A. The scenarios were translated into opportunities, which were put onto two axes. With the matrix that created, all possible combinations of these opportunities were looked at. From these combinations a final scenario was derived.



Elements are combined to divide the Fields of Opportunities

3D scenario board

Just like in case 2, we used the 3D scenario board as an inspiration to our ideas. The board made it easier to imagine where the furniture would be used and how far it would have to be transported. Looking at the board, we concluded the community center would be a good place for the mobile furniture in our scenario. Again the board made us communicate interactively. This enabled us to come up with more ideas.

With the idea of tourists visiting the slum, we used the board to generate possible routes the tourist would take through the slum.



Phase 2 Integration

Opportunities

From the scenarios written in the previous phase a list of opportunities is distilled. These opportunities carry features of the future CIPS, including usage and production. A list of opportunities can be found in appendix B.

Just like in case 1 and 2, we created a matrix from these opportunities. Combinations of the opportunities were made, described and labeled according to there importance. From the combinations we found most important and inspiring, we created the final scenario. A graphic representation of the matrix can be found in appendix B. The following combinations were made. The letters used correspond to the location in the matrix.

Most important

A The community center owns mobile furniture which is available for all local events

B The mobile furniture is used for performances and events of the local community center

C Locals are guided by the local bank to start as an entrepreneur. These businesses are located around the slum and contain one piece of mobile furniture. During group meetings with the bank, the mobile furniture is used. In this way the mobile furniture serves as an icon for new and successful entrepreneurs in Setting X.

Important

D The local radio promotes upcoming movie events.

E The school invests in mobile furniture for classes, workshops and move nights. The school can also organise events for locals who are not particularly involved with the school.

F Food and beverages are sold at (sport) events

G The mobile furniture is located at a central point within Setting X. On this location Led lights and Pedal Power stools are placed to synergize with each other.

H The plastic upholstery of the mobile furniture is designed by the local residents of setting X.

I The mobile furniture is used as tool for promotion, which isn't used commercially or to benefit financially with.

J The mobile furniture is used for transportation services in the form of a new business.

K Every block of houses (set of houses) owns a quantity of mobile furniture which they can use for transportation.

L A new business arises which rents and/or sells mobile furniture

Least important

M A small business arises, providing food and beverages for movie nights.

N The community center organizes free cultural workshops in which local artists make designs for the upholstery of the mobile furniture with other locals.

O Spielberg finances workshops and records them for his new feel-good movie.

P People can pick up mobile furniture at central location to provide seating for local events

Q Providing sport teams with mobile furniture which can are personalized to the particular teams. The teams can bring the mobile furniture to games, so supporters can sit on it.

R The mobile furniture is free to be used by every local, but it has to be returned when it is needed for local events.

Final concept of the CIPS

Final Scenario

Central in this CIPS is the new business CultureClash. The SEDG Pamoja will coordinate the setting up of this business and help it in acquiring loans (a microcredit at the local bank) and making investments. When the CIPS is fully integrated in the slum society, Pamoja will select and train people from within the slum and pass on the new business to them. This way Pamoja can leave the slum after some time and move on to another slum, where they can also introduce the different projects.

First CultureClash will invest in setting up a production line of mobile furniture, this will be done in cooperation with the workshops. A part of the mobile furniture will be exported to the Netherlands, where they can be sold in the Bijenkorf. The profit made with the sales to the Bijenkorf will be used for organizing free cultural classes in the Community Center, CultureClash will also place some mobile furniture in the Community Center. This furniture will be the possession and responsibility of Culture Clash, but the furniture will be freely available for the community

Everybody in the slum can join these classes and at the end of each course a final performance or exposition will be given. These 'happenings' will be promoted and all the inhabitants of the slum are invited. On the day of the performance, the group of actors will take the mobile furniture to the open space where they will perform, while doing this they will form a sort of parade, promoting their own event to all the inhabitants.

CultureClash will also contract a travel agency, specialized in slum tourism. This agency will offer their tourists a tour through the slum where CultureClash is located. This tour will end with a dazzling performance of the participants of one of the cultural classes. Organizing the tour will be the responsibility of CultureClash. This way we can make sure that the tour shows positive quality's of the slum, instead of resulting in so called poorism (rich tourists looking at poverty for fun). Besides showing the positive qualities we want to involve the tourists in the slum and make sure that the inhabitants and the tourist will develop a positive relation towards each other. In return for organizing the tour CultureClash will get a fee from the travel agency. This money will be used to assure continuity of the CIPS.

During the tour (mainly during the performances) slum inhabitants also can earn a little on the tourists. They will get the opportunity to sell homemade art or food and beverages to them.

Position and function of the elements

To give a clear overview of the position and function of the elements within the final scenario a summary is made. It gives an idea of the role of each element.

SEDG Pamoja
First of all its Pamoja's task to promote this new project in the slum. Once again this will be done in the community center, because here a lot of people can meet.

When the project has received enough acquaintance, Pamoja will start the new business. Just like with LitterLogic (Case 2) Pamoja will begin with setting up this business and with time employ people from the slum to work there. When Pamoja leaves the slum, the most capable and dedicated employees are promoted to managers of the business. More about this new business is discussed in the next paragraph.

New business: CultureClash
The new business will be the most important element in this scenario. It will be in charge of the following:

- Invest in mobile seats, which are made at the workshops; They give the assignment
- Sell mobile furniture to De Bijenkorf
- Organize cultural classes for the slum residents for free, like playing music, acting and painting
- Organize events where the participants of the cultural classes can show their new skills
- Engage in cooperation with a tourist agency, that will let tourists come to the slum
- Organize guided tours for tourists and let them see the performance of the slum people

The cooperation with the tourist agency and the guided tour will realize profit. All the facilities and activities can therefore be provided to the slum residents for free. This makes them accessible for everyone, thus creating more social cohesion within the slum. Furthermore a better understanding between the poor slum people and the rich western people is achieved.

A part of the mobile seats are sold to De Bijenkorf to earn money, the other part is used at the cultural classes. When an event is taking place, all the seats will be moved to the central place, so spectators can have a seat during the show. Tourists and slum people will sit together and may have social interaction while watching.

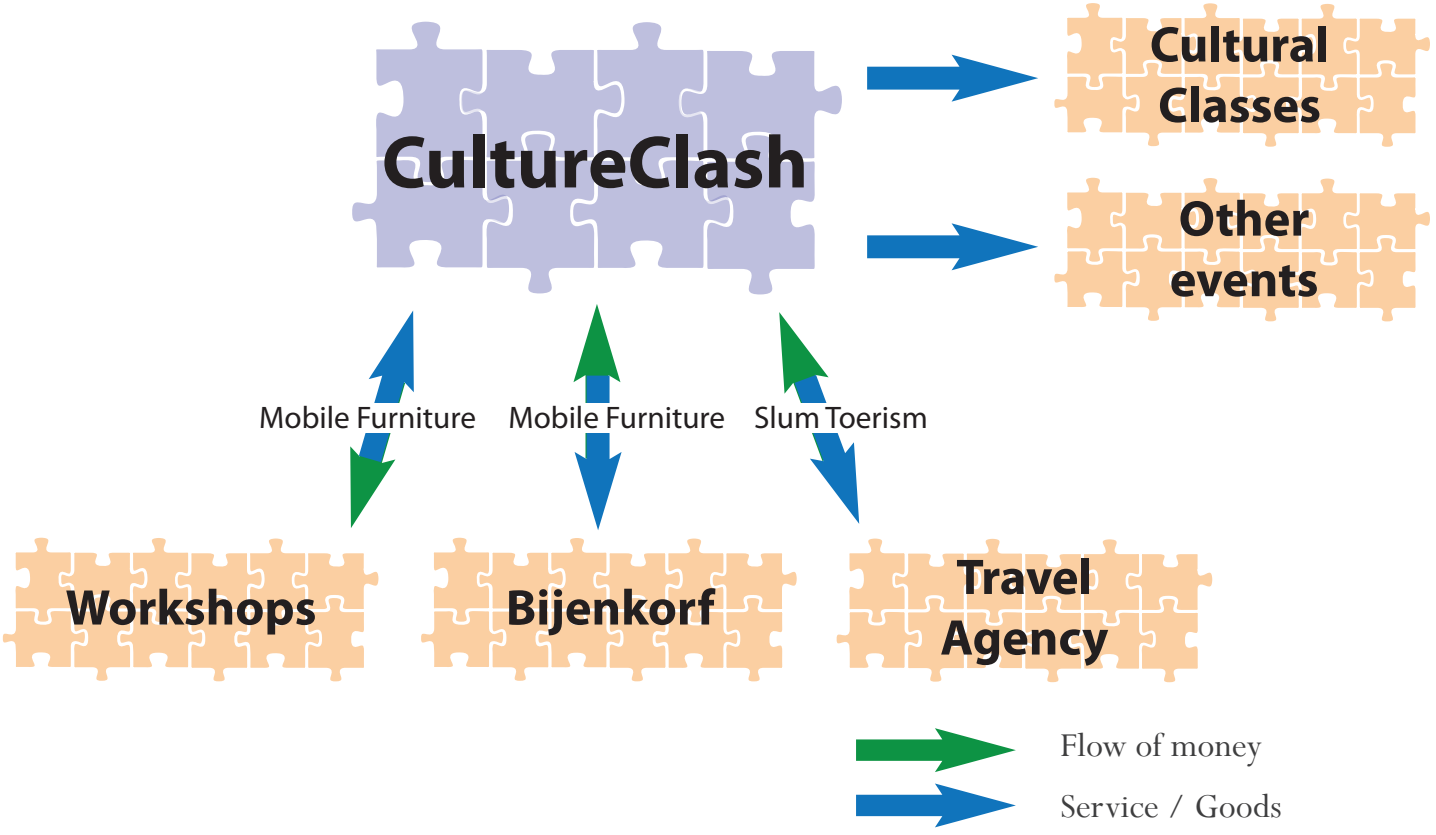
Workshops
The workshop will get the assignment of the new business to make the mobile furniture. For the manufacturing of the bags, a joint venture is established between the three workshops. This way a close work relationship is maintained, which is good for the quality and efficiency. A plus is that it also improves social cohesion among the workshops.

Community center
The mobile furniture will be stored at the Community center. Here the cultural classes are given by different teachers from the slum (as much as possible). When there is much space needed for a class, the furniture can be moved to the side of the room or to outside the center.

When there are no classes anyone can use the mobile furniture, as long as it is brought back to the Community center before classes start again.

Households
The individuals will have the opportunity to learn new skills and join fun activities. All the cultural classes can be attended for free, so everyone can join. Because they are part of a class and will show their new skills at the events, their sense of belonging is increased with this project. Furthermore their social networks are broadened, because they meet new people at the classes.

Bank
The bank will provide a microcredit loan to Pamoja so we can make the necessary investments.


CultureClash
Cultural Classes
Other events
Mobile Furniture
Mobile Furniture
Slum Toerism
Workshops
Bijenkorf
Travel Agency
Flow of money
Service / Goods

Collage slum tours

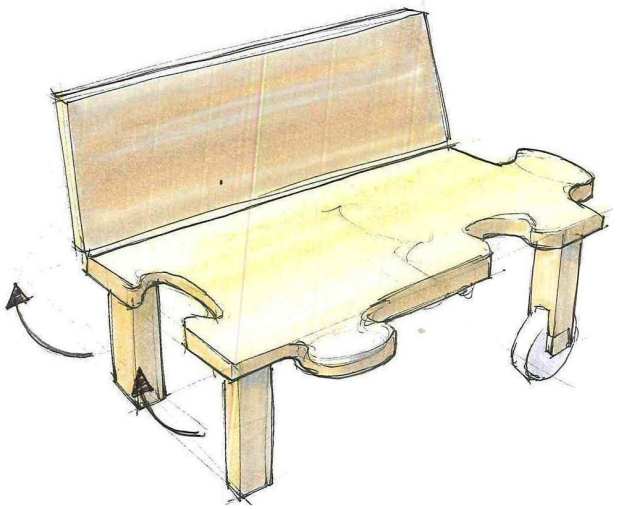


Slum tourism versus slum voyeurism

Slum tourism has been a controversial issue ever since it first started arising in and even got more critics shouting their two cents, after the business saw a great increase in attention due to Danny Boyle's hit film Slumdog Millionaire. These critics argue by stating that slum tours represent the worst kind of travel voyeurism known to mankind, utterly degrading and exploiting those who can not afford to protect themselves from it.

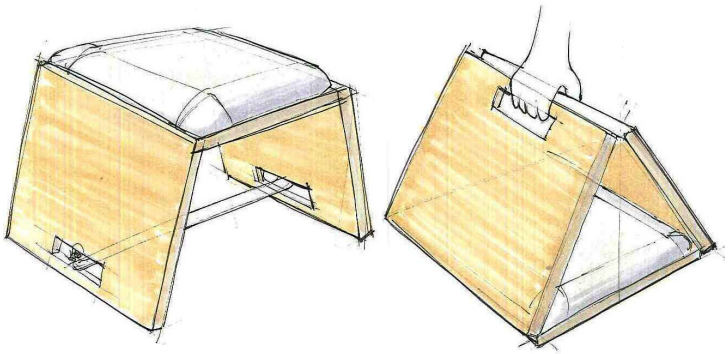
Pamoja sees these slum visits, not as despicable, but as completely justifiable provided that it is done properly. By setting up the CultureClash project in the slums, with the people of the slums and by the people of the slums, Pamoja seeks to a certain that the project' profits, derived from the people outside the slum, are completely funneled into the slum, increasing the state of the slum in many different ways (such as job opportunities arise, more sale opportunities for the local vendors, etcetera). On top of that, the CultureClash Project allows the slum inhabitants to show the world their talents in for instance sports, dancing, crafting and working together, thus increasing their sense of belonging.

To come up with concepts for the mobile furniture, many concept sketches were created. A collection of the first sketches can be found in Appendix C. On this page the concepts can be seen of the most interesting ideas.



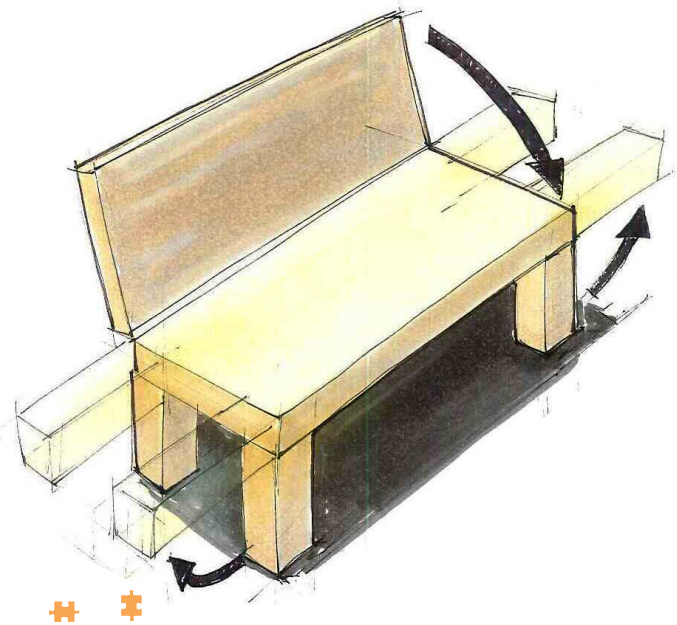
Concept 1

One pair of legs can be rotated outward to create the handles. The other pair of legs have wheels on the bottom. The seating has the shape of 2 puzzle pieces. This allows the benches to be connected in different arrangements.



Concept 2

This concept is just one seat, which can easily be carried with one hand. The "legs" can be folded in such a way that a handle is created.



Concept 3

Legs can be rotated outward and the back can be folded down to create a board with handles. This way the bench is easily moved and allows things to be carried on top.

Choice of concept

The collage of the slum tours on page 16 shows the atmosphere of the slum tourism at which the mobile furniture will be used. As with the garbage collector, the mobile furniture should be able to cope with the small and muddy passages of the slum. At the same time the furniture should stay clean and comfortable after moving. On top of that the furniture in the slum will be used by both inhabitants and tourists.

The mobile furniture will not only be used in slums, but will also be sold in the Bijenkorf. The concept we choose should be appealing for both target groups and enhance the social cohesion in both cultures. Therefore the final concept that was chosen is concept 3. The design of the concept fits the portfolio of the Bijenkorf but also emphasizes on the social cohesion aspect. The puzzle seating from concept 1 is also used. Because it is natural for people to connect these pieces, this will create social cohesion. The legs of the bench can be rotated, forming a stretcher like object, which can be carried by two people. This way people have to cooperate to move the furniture and small and muddy passages won't be a problem. People moving the furniture will be eye catchers and so inform the slum inhabitants that something is happening. When the legs are rotated, the bench can also be used to transport things, like for instance objects used in the performances.

CAD model of the mobile furniture



The new business: CultureClash
organizes
cultural classes for slum inhabitants
events for slum inhabitants and tourists
guided tours for western tourists
is gradually taken over
by slum inhabitants

The SEDG Pamoja
informs
manages
promotes
designs
finances
collaborates
with community center and workshops
exports to De Bijenkorf



The workshops
sells
makes

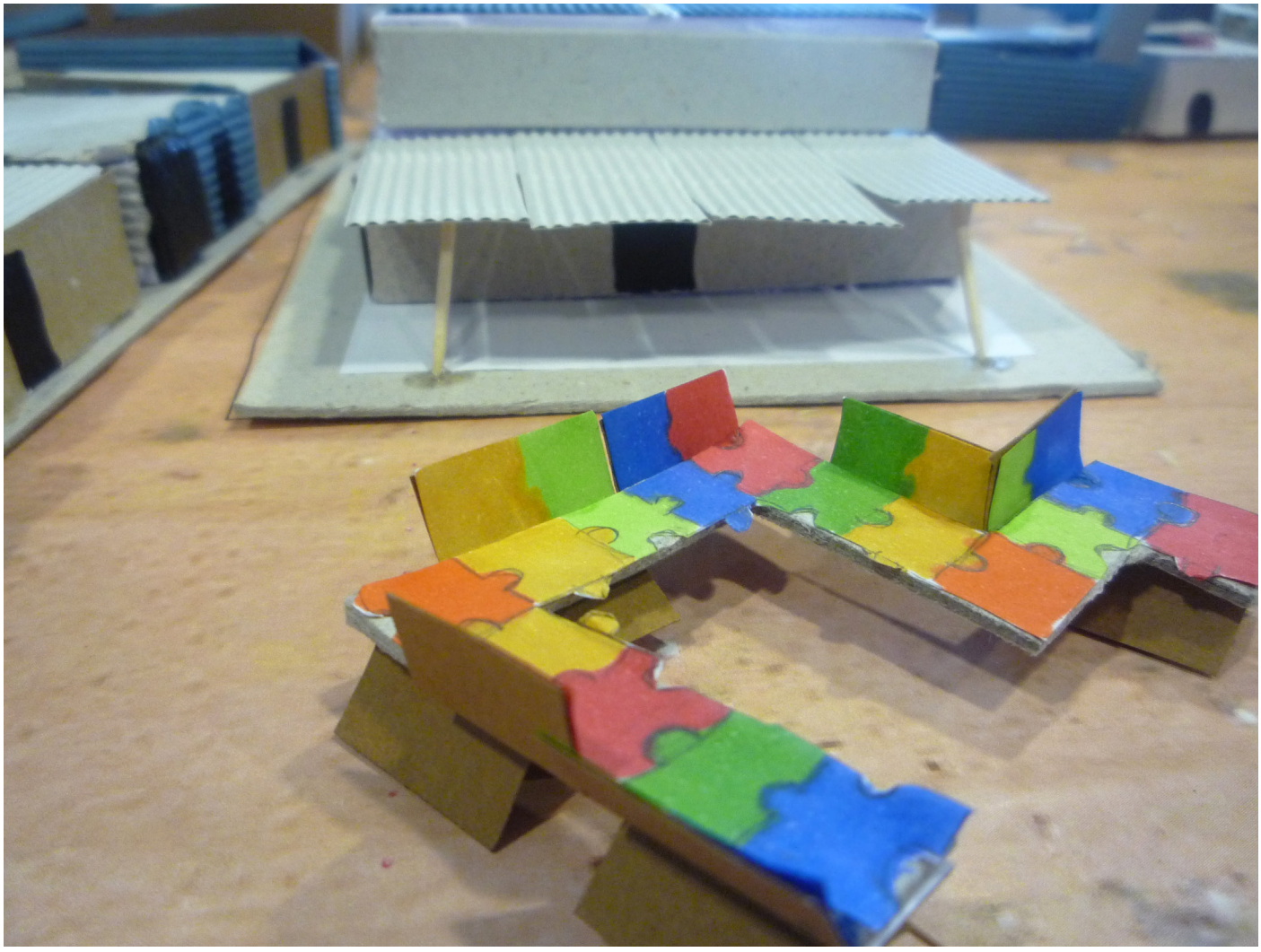
The community center
facilitates
room for cultural classes

The households
attend cultural classes
learn and show new skills

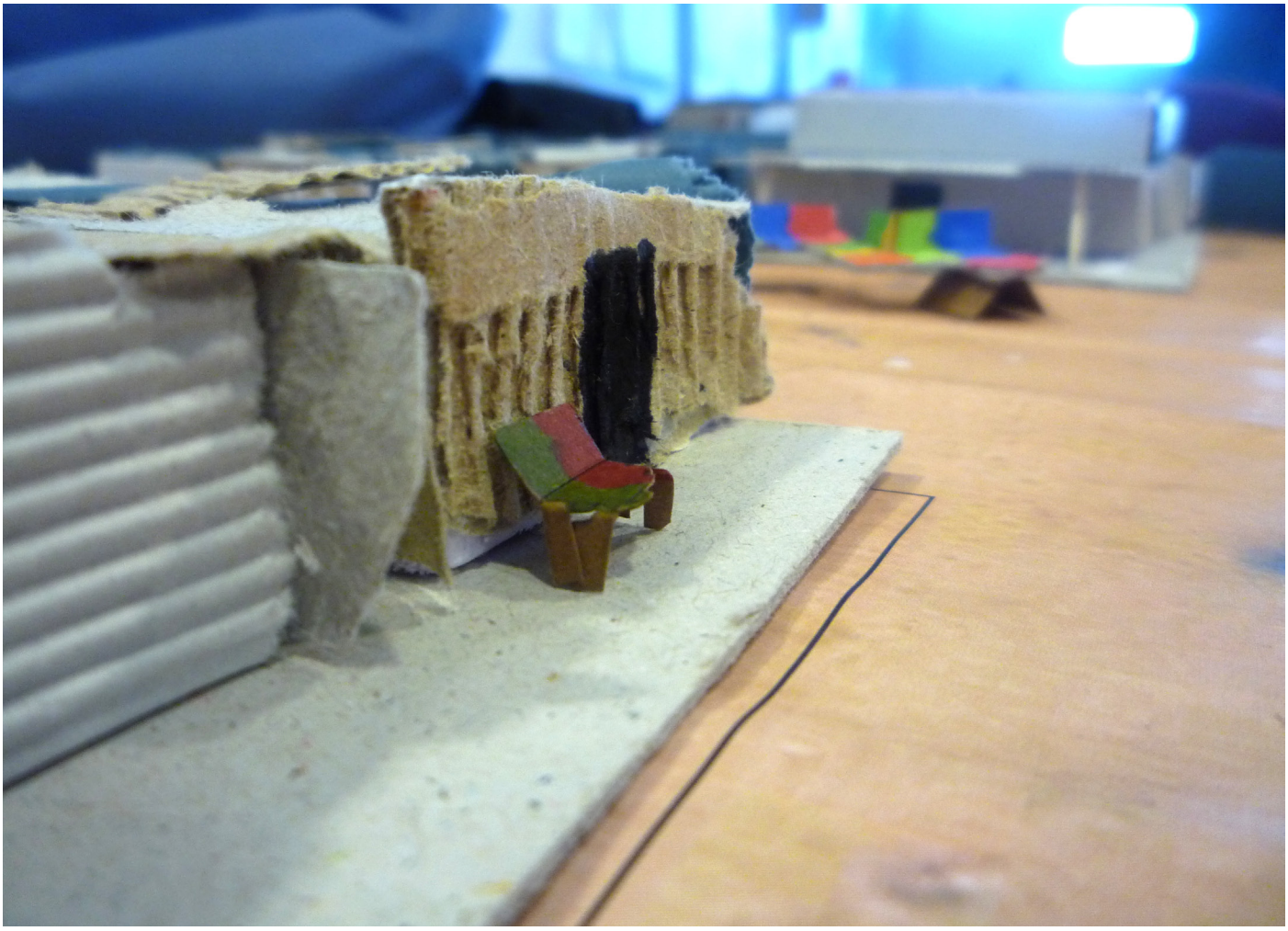
The bank
provides a micro credit loan
to Pamoja

The travel agency
collaborates with CultureClash
to give tourists a guided tour through the slum

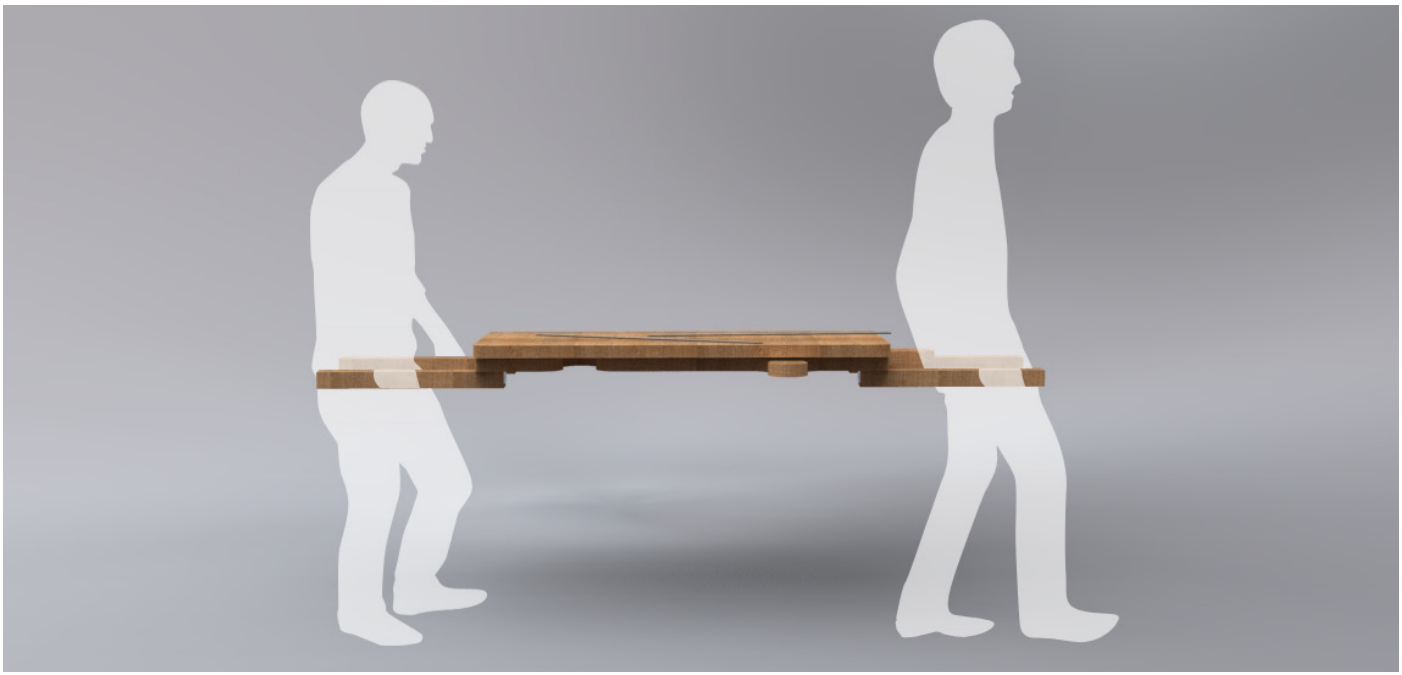
Several mobile benches linked together in front of the community center



Mobile bench in front of one of the houses



Mobile bench being transported



Mobile bench painted by the local artist



Phase 3 Implantation

The Project: CultureClash

After some debate, we decided to name the project CultureClash. The name and logo emphasizes different cultures getting in touch with each other. Culture clash generally refers to the misunderstandings and disagreements of different cultures, but we believe it can also be perceived less negatively. Through the performances, the tourists learn about the culture in setting x and vice versa. These meetings will satisfy the tourists and will contribute to the improvement of the slum.

The mobile furniture makes these meetings between cultures possible. It does not only provide seating, but also stimulates contact between the tourists and slum inhabitants.



Introduction in the community

After a microcredit is extended by the local bank, Pamoja will be able to establish the CultureClash Project in Setting X. After making the first necessary investments, such as the creation of the first pieces of furniture and part of the prototyping, the system will be introduced and promoted in the slum, which in terms will most likely be most effective when conducted using the community center, where many local residents can be informed at the same time and where proper discussions can be held. Advertisement by word of mouth will again be valuable during the introductory stage of the system. Since good experiences of neighbors will take away this suspicion and make them too enthusiastic about the project. In short, the mobile furniture system offers the community of Setting X the following main advantages:

- An increased level of wealth
  - Money from outside Setting X can be funneled into the community, increasing the overall wealth of the community.
  - More job opportunities arise for the slum inhabitants
  - More trade opportunities for local vendors
- An increased level of education, since the classes that will be held are always useful for slum inhabitants in some manner.
- An increased sense of belonging, since local inhabitants can show their skills derived from living in the slum and their pride for their slum, quite possibly together with fellow slum inhabitants.

During this introductory stage of the system, employees will also have to be found locally and communication needs to established with the workshops, local artists and local event managers (such as the school, the local soccer team, etcetera). An important element of the setting that also needs to be attracted by Pamoja this time around, are the travel agencies in the nearby cities, since the cooperation with this group will realize the profit for the project. During this process a scenario is created, detailing the contents of the slum tours and how they will be conducted in particular the case of Setting X. This will serve as a script for the first few tours. As the mission statement of Pamoja states this project is meant for the long run. So when the social entrepreneurs leave the slum, the project will still be vivid. In order to reach this, the SEDG will be slowly be handed over to the slum it self: the most dedicated employees can be promoted to managers of the business, so Pamoja is able to eventually leave the slum and allocate elsewhere. Pamoja's role in the system can remain the role of consultant.

Community workshops

To make the CultureClash project successful, Pamoja will have to inform the residents of the slum about the advantages of this project discussed above and all the possibilities it brings with it. At the beginning the risk will mainly lay with Pamoja, so the threshold for slum residents is relatively lower to join the project, since they have no fear of losing personal property. To inform as many people as possible, but still be able to give solid information, Pamoja will organize meetings at the local community center. At these meetings Pamoja will inform people about the new business that has been started up and ask people to join.

All the elements found in Setting X will have a role in this project:

- Workshops will create the mobile furniture that stand at the core of the project
- The school can initiate and help organise many different and interesting events
- The media center can promote and encourage local events for the slum tours
- Households, the market and the water basin withhold interesting people and spots the slum tours can include
- The local bank can inform locals on how to obtain, use and pay back micro credits in special workshops
- The local authority can see to it both the slum inhabitant and the slum visitor are respected by each other
- The community center serves as key point for the introductory stage of the project and later serves as gathering point for the mobile furniture

Everyone will have to possibility to provide Pamoja with feedback for the system, which in terms can lead to the implementation of unforeseen wishes into the CIPS. Once business has been established, Pamoja can employ people and train individuals who want be involved with the project. If really dedicated and qualified persons rise up from this group during the project, they may

be asked to take on roles, members of Pamoja have, once Pamoja leaves the slum. Furthermore the workshops have to be instructed about how to manufacture the mobile furniture. They will also have the opportunity to give feedback on the design, so the eventual product will be produced as efficient as possible, once it is perfectly in balance with the local available elements.

Promotion

The CIPS that Pamoja will introduce is one that will be very beneficial for all slum residents. Not necessarily for their work or survival, but it creates a new way of entertainment and personal development. It will probably be easy to make the slum residents enthusiastic about this project, since they don't have to put in any money or risk to be able to join the cultural classes.
Of course it is important to find the right teachers who will give these cultural classes in theatre, music and more. To do this we have to look around in the slum itself for people who have the capabilities to teach and have talent for some kind of art. We assume that since there are local artists, there are also some musicians, dancers and so on living in the slum. We have to convince these people to join this project with interviews in which we tell about the advantages of participation. They will be paid for their work as teachers, with the money earned with the sale of mobile benches to De Bijenkorf and the guided tours. Of course, when teaching, they will also gain a higher status, which will make it more attractive to join.

To promote the cultural classes among the 'regular' slum inhabitants, meetings will be organized in the community center that everyone can attend. Also some posters may be placed through the slum to promote specific upcoming classes and events. When the slum people realize that the classes are informative, interactive and fun, they will soon join. All participants will be encouraged to show their (new) skills on the events that will also be promoted. Here also tourists will be present, who will have to make small financial contribution for watching the show.

To start the collaboration with a travel agency, Pamoja should contact a suitable travel agency, which wants to facilitate in bringing tourists to the slum for a guided tour by CultureClash. There will definitely be a travel agency who wants to work with us, since 'slum tourism' is popular business at this moment. CultureClash itself will organize the tours and charge the agency. The travel agency then can charge the tourists more to gain profit.
A contract should be set up to secure all the conditions and regulations. Both parties should build a on a working relationship of trust and understanding.

Pamoja has a promotional budget of $200. The allocation of the promotional/prototyping budget will be as following:

Interviews with potential teachers:	
15 x $ 3 (brochures, food etc)	$ 45
Meetings in the community center:	
2 x $ 10 (brochures, posters, food etc)	$ 20
Prototyping in the local workshops	$ 50
Placing promotional material through the slum	$ 20
Setting up contracts with travel agency and Bijenkorf	$ 40
Buffer	$ 25
Total:	$ 200

Business plan & Planning

Below is a business plan, fitting the CIPS described earlier in this report.

Introduction

The Social Entrepreneurial Design Group (or: SEDG) Pamoja, consisting of P.J.M. Hoogreef, S. Jagtman, D.I. Janssen, T.N.T. Ngo and J. Timmermans, will start up a CIPS (Community Integrated Product System) in the fictive slum Setting X. For this, contacts would be made with the local microcredit bank, the workshops and the community center.

The plan of Pamoja is to take a microcredit loan and invest it in mobile furniture, that can be borrowed by inhabitants for events or workshops, that are also organized by the CIPS - CultureClash. The SEDG can make money by selling a part of the mobile furniture to the Bijenkorf in the Netherlands. The design is very basic, so it can be produced locally at the workshops. The price of one bench, that consists out of steel and wood, will be estimated at 25 dollars.

Pamoja will coordinate the whole CIPS. At a certain point, the new business will take over from the SEDG. Within a couple of years, Pamoja will stop the coordination and gradually leave the slum, leaving the project in the hands of the new business.

Investments

•	10 Benches ($25,- each)		$250,-
	• Wood	$15,-	
	• Steel	$5,-	
	• Production & Assembly	$5,-	
•	Promotion & prototyping		$200,-
•	Unforeseen costs (±11%)		$50,-
Total investments			$500,-
Required loan			$500,-

Financing

To finance this project, a microcredit will be acquired at a local bank in the slum/setting X. A number of 35% is used as a realistic average interest rate (Kneiding & Rosenberg, 2008). The loan is to be paid back by the SEDG/new business within 5 years. The bank will supply a loan of $500,-: this will be invested by Pamoja as described above. The SEDG will invest $200,- of this money on promotion and prototyping and helping starting up the project.

Forecast 5 years

An overview of turnover, costs, profit and cash flow for the coming 5 years can be found is appendix D. A summary is shown below.

Summary forecast first 5 years	Year 1	Year 2	Year 3	Year 4	Year 5
Turnover (selling benches to bijenkorf, tourism):	$11.200,00	$6.200,00	$6.200,00	$8.700,00	$8.700,00
Costs (wages, maintenance, interest, closing, promotion):	$3.410,00	$3.375,00	$3.355,00	$3.420,00	$3.485,00
Depreciation:	$50,00	$50,00	$55,00	$60,00	$70,00
Net profit (tax included):	$5.805,00	$2.081,25	$2.092,50	$3.915,00	$3.858,75
Cash flow:	$5.855,00	$2.131,25	$2.147,50	$3.975,00	$3.928,75
Payback to bank:	$100,00	$100,00	$100,00	$100,00	$100,00
Money for new investments:	$5.755,00	$2.031,25	$2.047,50	$3.875,00	$3.828,75

As said before, the turnover of the SEDG/new business consists of selling the benches to the Bijenkorf and giving toerists slum tours. Each year, a small part of the profit is used to invest in more mobile furniture to make more profit and most of it is used in community improvements. The money that is not invested can be used to invest in better educational/community facilities or enable more people to go to school, follow workshops, organize events etc.

In the fifth year, some money is spent on promoting the concept in neighboring slums, to expand the CIPS.
The Bijenkorf will sell the benches in goodwill; with no profit in the first year. Thus the profit in the first year is approximately 60 dollars a bench higher than the other years. Transport costs and such are included in the selling of the benches.

As seen in the forecast, the cash flow in the first five years is high enough to pay back the bank each year, save money as depreciation and make profit. This profit/depreciation is partly spent on future investments in the next year, to make more profit and expand the company, enabling it to spread to other slums.

Upscaling

Setting X is a part of the slum with relatively more facilities than the surrounding slums, which means that people from outside our slum will come here for the things they don't have themselves, like education or entertainment.

Setting X is the first neighborhood where this project is started, so people from around will have to come here if they want to join the cultural classes. For slum neighborhoods further away or slums elsewhere, who can't reach our project here, it will be scaled up. New similar projects will be started there, once we've successfully set up and managed CultureClash in setting X.

The SEDG will leave setting X after 5 years, when everything is settled and CultureClash is handed over to the most capable and dedicated employees. When Pamoja starts similar projects in other slums, we can use the experience from CultureClash to improve the process and make it more efficient. The contacts with the travel agency may also come in handy, if they also operate in other areas.

The same promotional plan will be used to reach the inhabitants of the slum. They can also give feedback on the project, because not every slum is the same, so we should take into account the differences. When a certain slum doesn't have enough people with teaching potential, teachers can be sought in other slums. It is also possible to ask some teachers from setting X to teach in other slums. They already have the experience and may also train others for the job as a teacher for cultural classes, so they can eventually go back.

It would be great if this project can be spread in many slums, because unlike the previous cases, it doesn't only create capital for the slum inhabitants. The most important factor is the development these people can make in their personal interests. We believe that they need this kind of cultural education as much as we do here in the rich Western countries.

Upscaling

A planning is made to give a clear overview of what is achieved in the short (1 year), mid (5 years) and long (10 years) term.

1 year:
- CIPS well established and well known in setting X
- CIPS known by 5% of people outside setting X
- 25% of people in setting X join cultural classes
- 50% of people in setting X go to watch performances
- Good and stable relation with a travel agency is established
- First new businesses which are selling goods to tourists are established
- Pamoja Bench is introduced in the Bijenkorf

5 years:
- SEDG moves out and leaves control in hands of locals
- Loan of local bank paid back
- CIPS starts moving to neighboring slums
- 50% of people joining cultural classes is from outside setting X
- 90% of people in setting X use CIPS or are in some way related with the project
- 100% of people in setting X follow cultural classes or watch performances regularly
- New edition of the Pamoja Bench is designed, the production is redirected to a new slum

10 years:
- Setting X totally stable, tourists generate income for the cultural classes
- Setting doesn't produce Pamoja Benches anymore

Manufacturing of the mobile bench

This chapter describes the manufacturing of the mobile furniture. Of course the workshop should start with prototyping in collaboration with Pamoja. This way the flaws in the production process can be discovered and improved. A specific part of the budget is retained for the prototyping process.

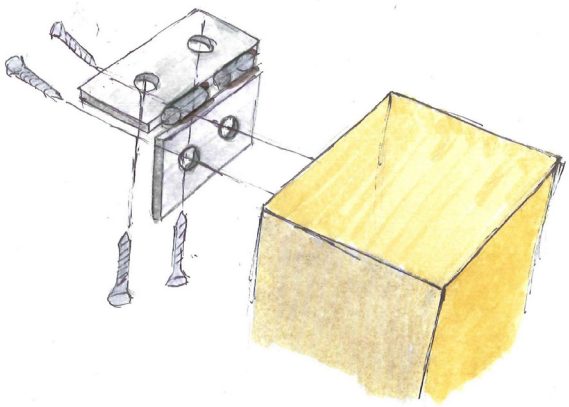
Because the bench exists mainly out of wood, the wood workshop will produce the parts and assemble the bench. The metal pieces will be purchased. After assembling the bench will be painted in lively colors.

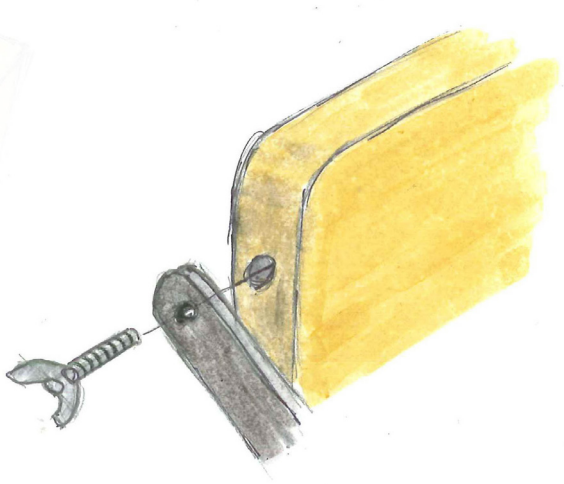
The Bench is made out of two wooden panels , seven hinges, 4 wooden legs and two metal bars. The seating of the bench is sawed into a jigsaw piece and is attached to the back of the chair with three hinges.

The four legs are also attached to the seat with hinges. Now the legs can be rotated outward and the back can be folded down to transform the bench into the carrying state , which can be carried by two people.



In order to keep the back in an upright position while sitting, two metal bars are added. These bars are attached with butterfly nuts, so the bars can be removed when then bench has to be folded. The attachments with hinges and butterfly nuts are shown in the figures below.





Group dynamics

For the last case, Fieke has been designated to be team captain of the group. The execution of the case has been going rather smoothly. It also takes less time to do the same work as in the previous cases. We've learned to be more efficient, because we can use the experience to improve ourselves. Of course we also know each other better by now, so we can respond better to problems that arise during the project.

Expectations

At the start of this case we expected that this case would pretty much be the same as the previous ones. And so it was mostly. The part that we had to make a trailer 'in cooperation with' Steven Spielberg, starring Harrison Ford, was very unexpected. Therefore we were somewhat afraid that this would make the process more difficult, because this part should be time-consuming. The fact that in this module we had one day less for the project, also scared us a little.



Individual vs Group functioning

The smoothness of the individual and that of group functioning have become more equal, since we've adapted to each other's working style. Fortunately our working styles are closely related, so not many problems have occurred. Decisions are made more quickly and brainstorming is more efficient. To become most efficient, work has to be separated. However, the division of tasks has never been a problem. Everyone is motivated to contribute to the project and results are always on an equal level.

We think we have functioned very good together during this course and the desired results are achieved.

Including social cohesion in product design

Appendix Case 3
Mobile Furniture

SEDG Pamoja

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Appendix A: Scenarios case 2

Mediacenter 1

Wamwara is listening to the radio, after a hard day of work. The presenter is talking about mobile furniture. He says there is a movie night coming up and everybody from setting x is invited. The movie will be showed on a big screen near the water basin and the mobile furniture will be used for seating. Ever since the mobile furniture has been introduced, more and more events have been taking place. Most of them have been organized by the local radio station. Wamwara decides to go to his friend on the other side of the slum. On his way his eye catches a poster he has not seen before. The poster promotes the mobile furniture shows the events where it will be used. The movie night the radio presenter was talking about is also on there. These posters are paid for by Pamoja, because they also promote Pamoja's projects. This enables people to organize events and promote them without costs.

Workshops 1

Rajabu works for the wood workshop. He started working there 2 weeks ago, because they could not cope with all the garbage collectors and benches that had to be created. Today Rajabu has to work together with someone from the metal workshop. Together, they will finish the mobile furniture they started yesterday. As they work, they learn about metal and woodworking. It takes them 2 hours to finish the bench.

Workshops 2

Ijaba is on her way to her work at the atelier. Today she will work on the upholstery of some mobile furniture. For the upholstery, plastic is ironed to create one thick sheet. For the filling, foam is used. This foam is bought locally in the nearby city. The upholstery for the benches which will go to the Bijenkorf is designed by the local artist. This means the local artist works together with people like Ijaba, using the available plastic to create a design. The local artist tells Ijaba to put grey and white plastic into a checkerboard pattern on this seat. He cuts plastic into a decorative piece which will later be ironed onto the pattern.

School 1

Today Pieter has biology class. The teacher wants to show a documentary about lions. When the whole class is present he tells them that today the lesson will be given outside. All the students are filled with joy, this is the first time they may be outside and watch a movie at the same time for school! In order to watch this documentary everyone has to help setting up the 'cinema'. The whole class walks to the Community Center. Pieter, Quirinus and a few other strong boys want to move the benches from the CC to just outside. The documentary will be projected on the white wall of the building. Simone helps the teacher making the 'screen'. When the mobile benches are not used by the school or by the CC, they are rented to the other residents of the slum, mostly for a day. This way the money for the investment can be earned back.

School 2

The school is working on a new project in the slum together with Pamoja. The school invests in mobile benches. During the day these are used by students in the classes. A few nights a week the school organizes movie nights. One night there's an educational documentary, one night a movie for children and one night a comedy or thriller. An outdoor cinema is set up these nights by moving the mobile benches outside. The school is in charge of choosing the movies and providing the projector. Some small businesses have started that supply food and beverages during these movie evenings. Everyone can see the movie, but if you want to sit on the benches, you'll have to pay a small fee.

Every time a few students of the school will move the benches after their last class. In return they may see one movie, that night or any other, or pass the free admission to whoever they want.

Households 1

Every household block nowadays has a few mobile benches. Every Friday night it's games night and the benches are placed around a few tables. Everyone can join the game he/she wants to play. Tonight Nico wants to play poker, so he helps moving the mobile benches for a poker table. Otto, his neighbor, brings his playing cards and a few more neighbors join their game of poker.

The bet is a six-pack of Coke. When games night is over everyone helps cleaning up and moving the benches back to their regular position. During the week when a family needs a mobile bench for inside or someplace else, they can just take it, as long as they bring it back after use. No one is afraid that a household is selfish by keeping it for itself. The households are very close so they don't mind sharing.

Households 2

It's 6 am, time for Victor to wake up. He has a few jobs to spread his risk of losing income, not all very fun, but what he has to do today he likes the most. First he eats some breakfast and then he has to go by a new business that rents mobile furniture. His job is to take one mobile bench at a time and try to rent it to the people of the slum. When he's done he walks back and takes another one. He really likes this job, because he's outside all day and can enjoy the sun. Further, he has to talk with people, which likes because he rattles every minute of the day and can meet new people. At the end of the day he tired, but content. Today he rented 3 mobile benches to some households for a week.

Market 1

Abdul works at the market each day; he has a small shop, nothing more than a blanket to sit on really, and sells fruits and vegetables. But lately, his business has improved a little, because he can grow some food himself on the community's vegetable garden instead of travelling to the city each day to get it there. It enabled him to lower his prices, but still making more profit; his costs are way lower. Word of mouth really helped Abdul; within a few days, people from neighboring communities also came to him to buy their food. Now that he has more to sell he makes longer days and more money, so he decided to invest in a piece of mobile furniture. He can use it to carry some stuff to the market and he can sit a part of the day. At home, he can also use it for himself and his wife to sit on, or take it to community events. Since he has to carry quite some things to the market each day and the bench is rather big, his oldest son Hank helps him move it.

Water basin 1

Jésus is jobless, he lately lost his last income, a small vegetable store, because he could not keep up with the competition. With help of Pamoja, he bought a piece of mobile furniture that he can use to carry water from the water basin to the houses in the slum. Here he collects empty bottles and cans and sells full ones. During his work, he can sit and talk with friends, while drinking some water. When he cannot sell all the water at the houses, he seeks his old market spot and goes there to sell the rest of the water to the people who are shopping there and do not want to go to the water basin as well. On the market, he can use the furniture to sit on and to keep the water in/on.

Public spaces 1

Today Fuzu and his team play the final in the Pamoja soccer tournament. Each block of houses had the change to form a team and join this competition. The whole neighborhood has been following the competition. Each block received two mobile furniture benches, which they painted in the colors of their team. When Fuzu and his team walk to the field, they take their furniture with them, so their supporters can sit and watch the game comfortably.

At the field they assemble the furniture and their own goal, which is also painted in their colors, red and green. The other team does the same and the game begins, sadly the other team is better and they win the game with 3 against 0. The designers from Pamoja present them their price, a Led Light, which they can place at a central point in their household.

Community center 1

Inkozozana walks to the community center, it is beautiful weather and he wants to go to the theatre performance which is prepared by a group of people at the community centre. There are different workshops provided by the local SEDG Pamoja. When people want to go to a performance of one of this workshops, they go the community centre and ask for one of the pop-up benches . These benches can be set up within a few moments and there is place for four people on the bench.

Inkozozane and his friends take their bench and walk to the field where the performance will be take place. There the camera's of the world famous movie director, Steven Spielberg, are already set up. He is filming al the performances and the crowd for his new feel good movie. He also provided Pamoja with enough money to build mobile furniture and organize workshops for the slum inhabitants. Everybody can join the workshops freely and they even get a consumption during the evening. No wonder that the workshops are extremely popular.

A few months later the whole community is at the same field, watching the film that he made on a giant air screen. There are foods and beverages for everyone and it is a great evening. Now the film is done, Pamoja will receive a small amount of the profit, enough to keep offering the workshops !
Public spaces

Kukumbatia walks to the square where the mobile furniture docking stations are placed. Luckily there is still some mobile furniture left in the docking station. He chooses one of the benches and looks to the map, which is painted on the docking station. He looks up the house block where his friends are living and places a cross on the map. Then he writes his own name, the date and the time on the chalk board and carries the bench to his friends. There they play cards, chat and enhance their social networks. At the end of the evening, Kukumbatia, walks to the square and returns the bench. There he sees the sign, which says that Pamoja designed this benches for their slum, with the profit made with Pamoja collection sold at the Bijenkorf.

Community center 2
In the slum where Peke yake lives, a big change has taken place. People now –a- days sit on the mobile furniture instead of on the ground. At the community center people can try this new kind of furniture. Peke yake is very curious so he walks to community center, there a big crowed is already gathered around a few benches. All the benches have their own led light, so you can sit and socialize there all night.

Each house block can save money for a piece of furniture by creating graphic designs for benches, these designs are used for furniture which is sold in the Bijenkorf.

Appendix B: Opportunities

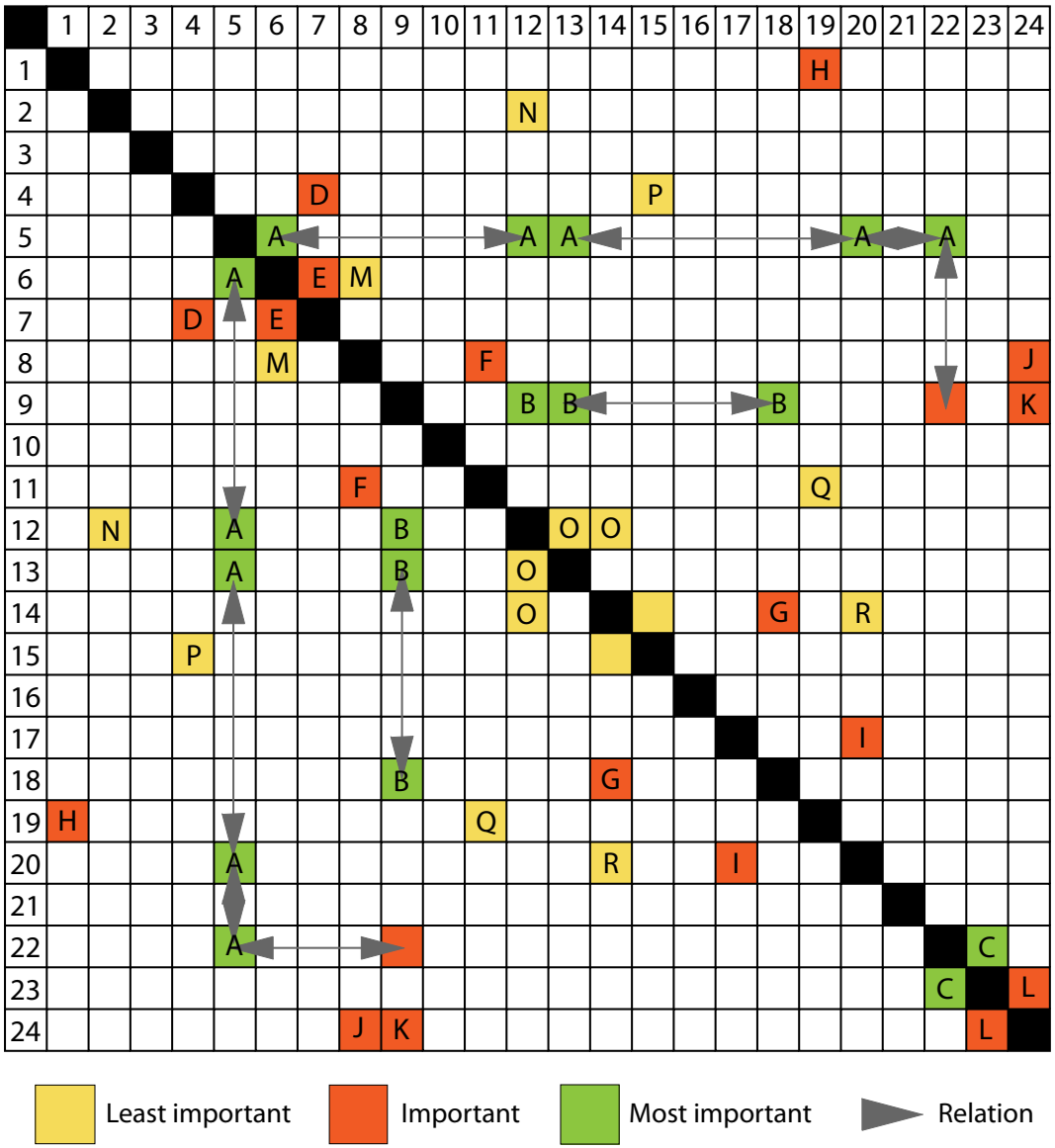
The following opportunities were created from the scenarios:

1. For the manufacturing of the furniture, recycled plastic and foam can be used, that is bought in the nearby city to upholster the mobile furniture.
2. The local artist designs the upholstery with the available plastic, but only for the furniture meant for De Bijenkorf. This gives the furniture a special 'slum design look'
3. To create the mobile furniture, the metal and wood workshops must work together. This increases efficiency and social cohesion.
4. Local radio is in charge of organizing and promoting events, where the mobile furniture is used.
5. The school and Community center invest in mobile benches to use them for classes and meetings.
6. The school invests in mobile benches for in classes and movie night. They are in charge of both. All slum residents can attend these movie nights.
7. During movie nights everyone can watch movies, but when sitting on a bench you have to pay a small fee.
8. A small business can be established, that supplies food and beverages for movie nights
9. Every household block owns a few benches, for social meetings like a games night. A family can use it, when needed, but place back after use. The block shares the benches.
10. A new business starts, that rents mobile benches. People work as a 'vendor' of rented benches. They get money for each bench rented to households or businesses.
11. Provide sport teams with furniture which they can personalize. The teams can bring their furniture to games, so supporters can sit on it. Pamoja organizes sport events. (Possible with a Pamoja product, such as the led light, as price for the winner)
12. The Community center organizes free (cultural) workshops for the slum inhabitants, so they can develop new skills.
13. The Community center owns the mobile furniture and loans them to people when they organize a performance.
14. Spielberg records performances of the Community center. The profit of the film is used for the mobile furniture project to invest in mobile benches.
15. Place the furniture at a central place where everybody can use it and move it, when needed.
16. Make a system to keep up the whereabouts of the furniture. For example, on a chalkboard people can mark where they are taking the mobile furniture for use.
17. Furniture is placed in the Community center as a promotion tool. It can be painted with promotional material.
18. Combine furniture and led lights/ PP stools to make it multi-functional.
19. Give people the opportunity to save for furniture by making graphic designs. For example, when you have made 5 designs, you can get a mobile bench (for a discount/free).
20. The mobile furniture is allocated throughout the slum for (press) conferences that involve people from all over the slum, possibly for educational purposes.
21. Local authority allocates the mobile furniture around the slum to oversee social behavior and group dynamics more effectively. When behavior is bad, furniture can be moved.
22. The mobile furniture serves as a meeting point for locals and representatives of the bank in order to teach locals about, for instance, microcredit loans.
23. Sell/rent mobile furniture to small entrepreneurs. They can use it to re-sell/rent or can use it as an addition to their tasks.

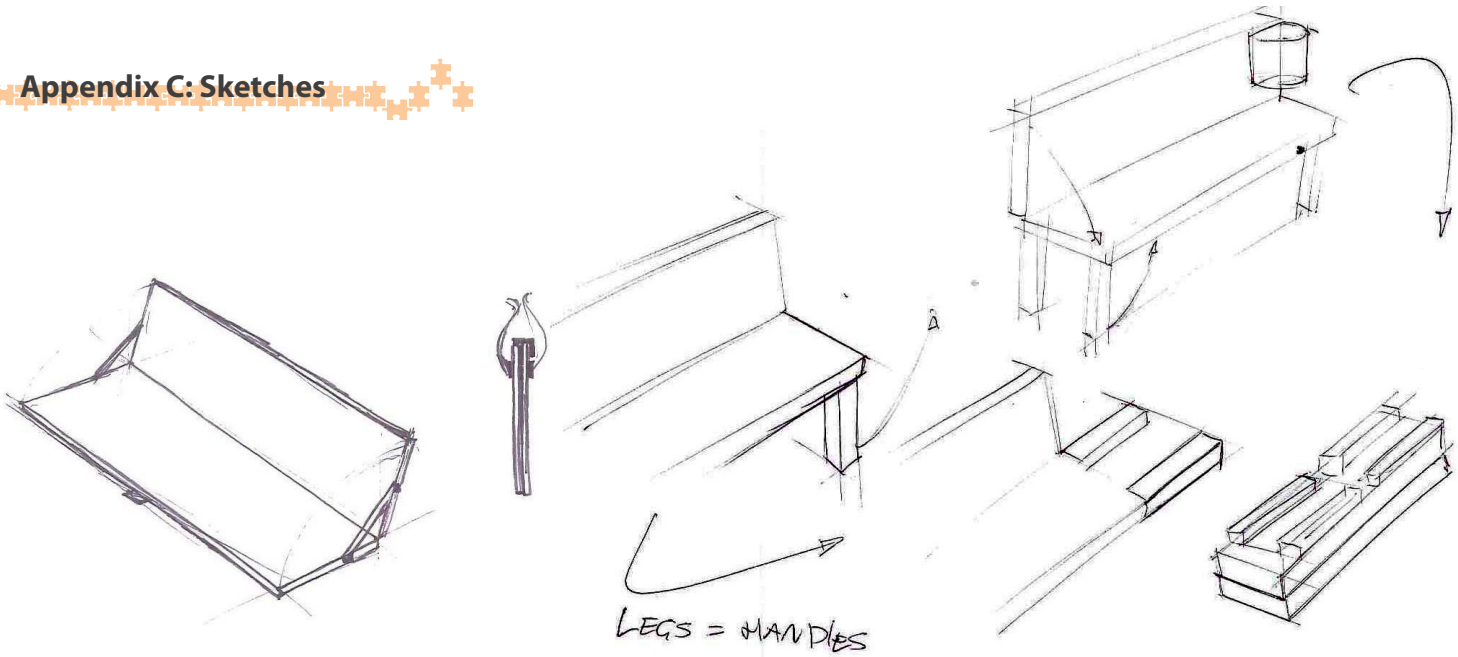
Small entrepreneurs use the mobile furniture during daytime for their jobs and before and after that at home.

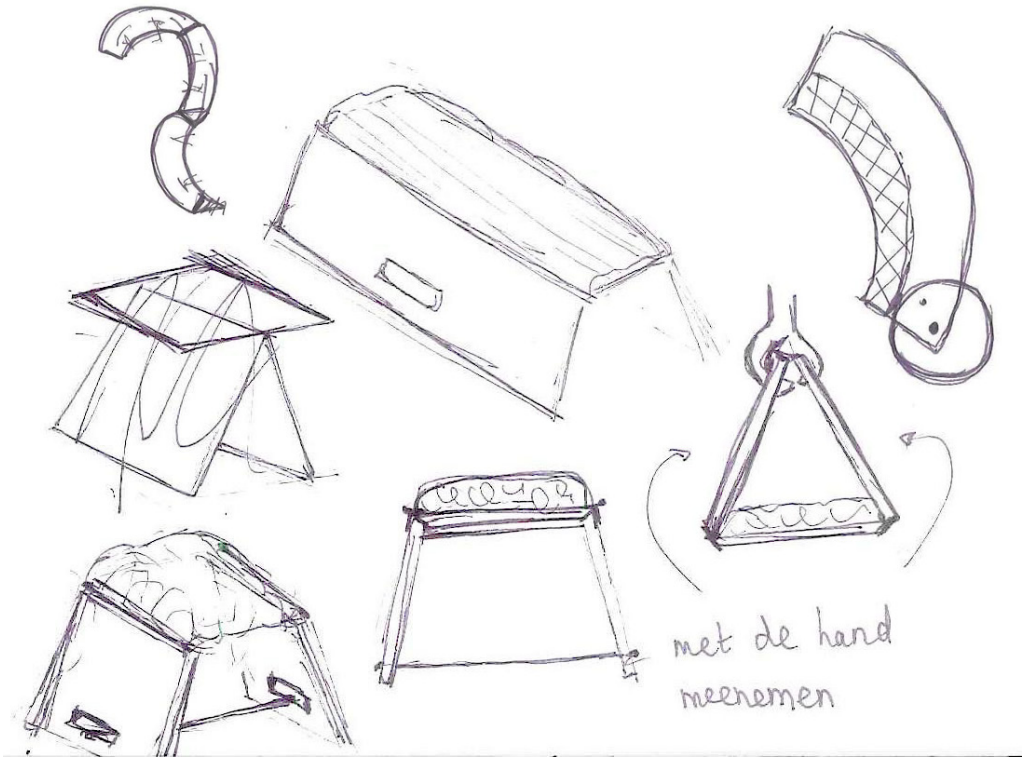
24. Use mobile furniture for transportation. The design should be adapted to a transporting function, to transport, for example, water or vegetables.

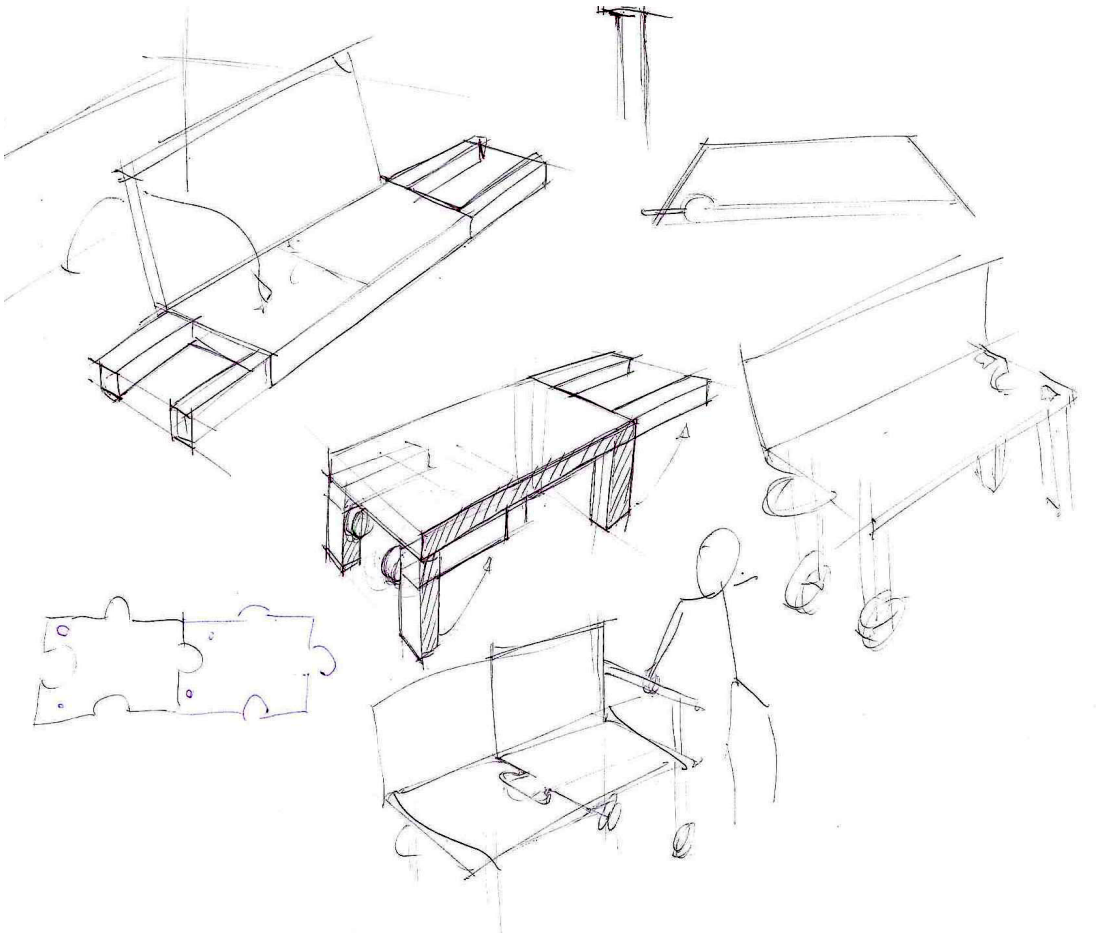
A graphical representation of the matrix with the combinations made can be found below. The numbers represent the corresponding opportunities.

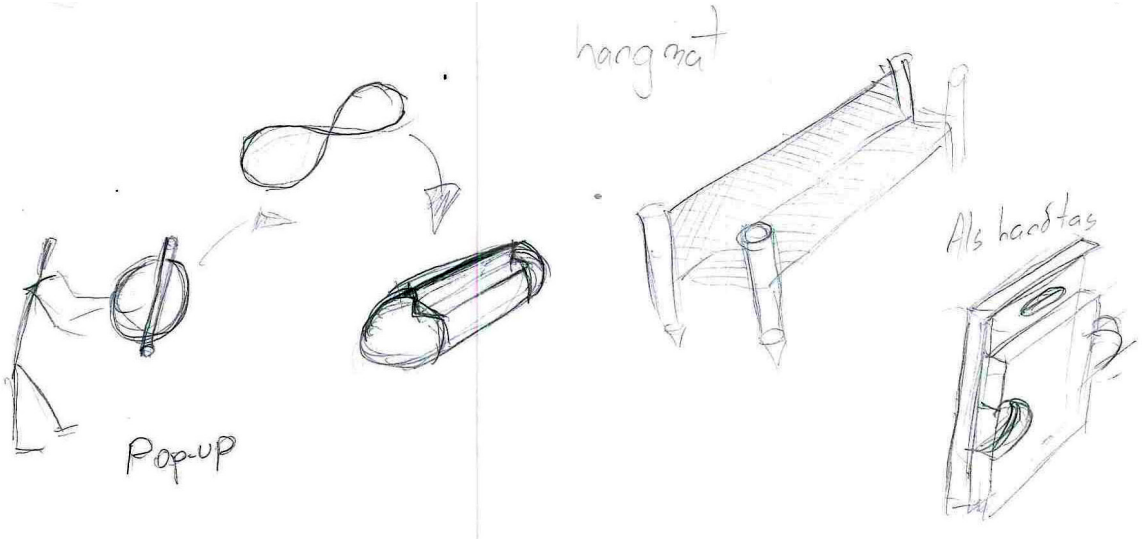


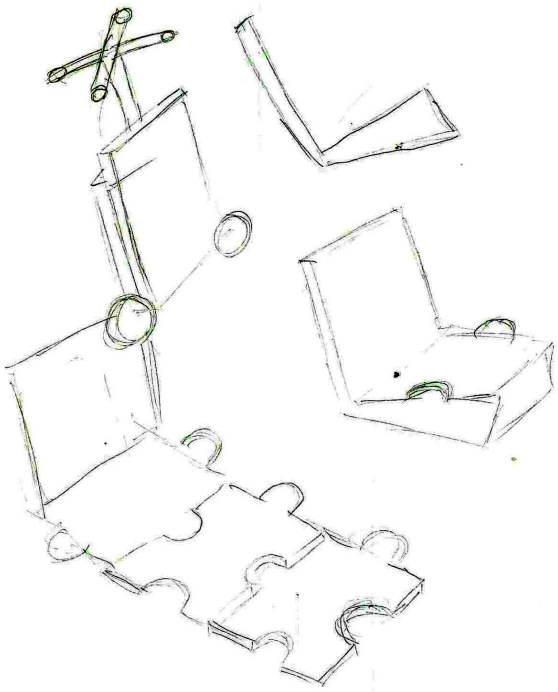
Appendix C: Sketches

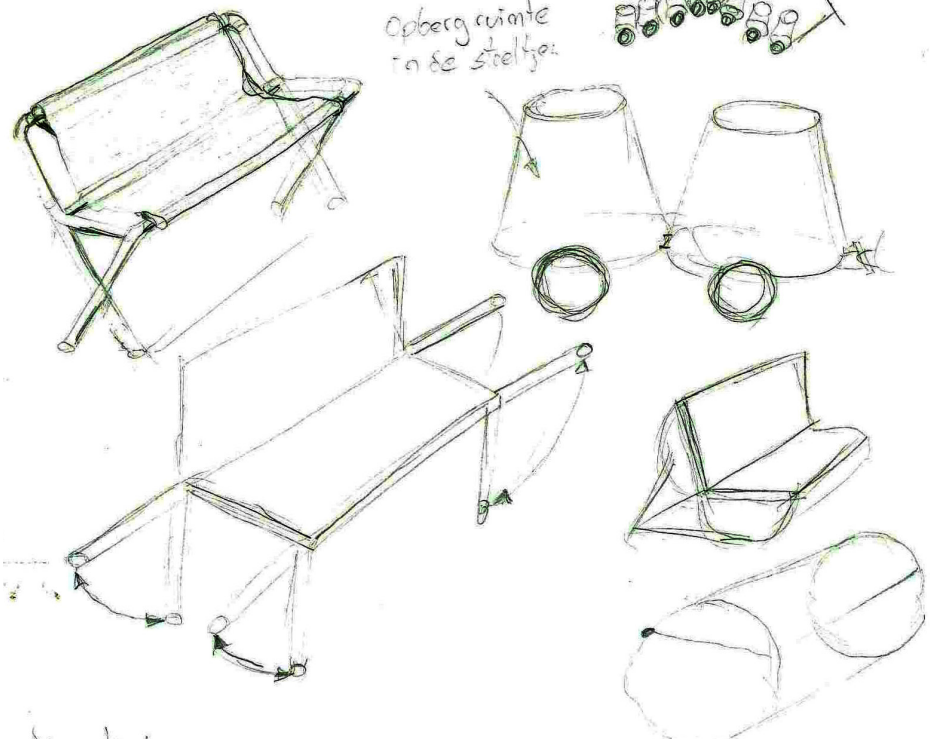




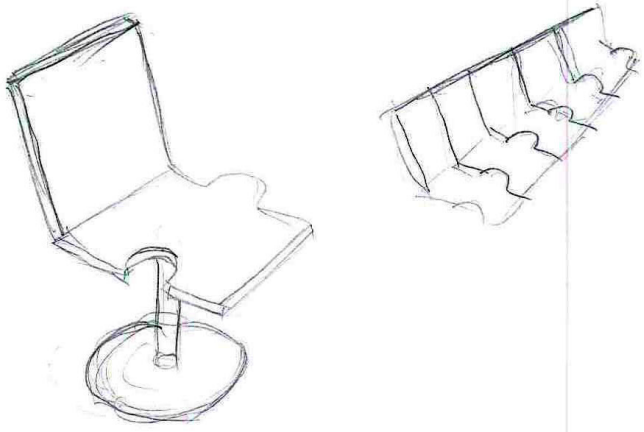



hangmat
Pop-up
Als handtas

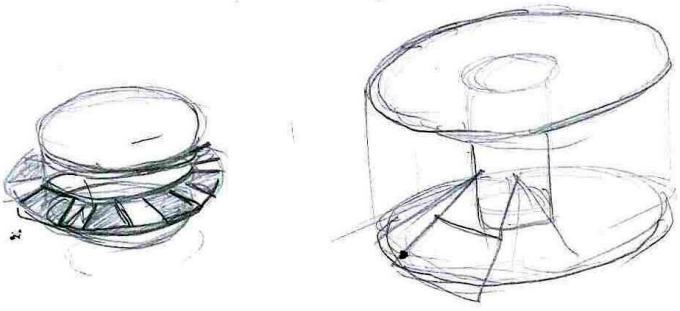




Puzzelstukjes



tafel met stoeltjes



Appendix D: 5 Year forecast

Forecast first 5 years

	Year 1	Year 2	Year 3	Year 4	Year 5
Turnover:					
Selling furniture to the Bijenkorf	$10.000,00				
Fee from travel agency	$1.200,00				
Selling furniture to the Bijenkorf		$5.000,00			
Fee from travel agency		$1.200,00			
Selling furniture to the Bijenkorf			$5.000,00		
Fee from travel agency			$1.200,00		
Selling furniture to the Bijenkorf				$7.500,00	
Fee from travel agency				$1.200,00	
Selling furniture to the Bijenkorf					$7.500,00
Fee from travel agency					$1.200,00
Turnover	*$11.200,00*	*$6.200,00*	*$6.200,00*	*$8.700,00*	*$8.700,00*
Costs:					
Furniture production (for export)	$2.000,00	$2.000,00	$2.000,00	$2.000,00	$2.000,00
Furniture production (for own use)	$200,00	$200,00	$200,00	$300,00	$300,00
Organize tourist tours	$1.000,00	$1.000,00	$1.000,00	$1.000,00	$1.000,00
Maintenance	$30,00	$35,00	$50,00	$50,00	$50,00
Interest - average (35%)	$175,00	$140,00	$105,00	$70,00	$35,00
Closing (1%)	$5,00	$0,00	$0,00	$0,00	$0,00
Promotion in neighboring slums	$0,00	$0,00	$0,00	$0,00	$100,00
Total Costs	*$3.410,00*	*$3.375,00*	*$3.355,00*	*$3.420,00*	*$3.485,00*
Depreciation based on 10 year	$50,00	$50,00	$55,00	$60,00	$70,00
Profit:					
Annual Profit	$7.740,00	$2.775,00	$2.790,00	$5.220,00	$5.145,00
Tax (25%)	$1.935,00	$693,75	$697,50	$1.305,00	$1.286,25
Net profit	*$5.805,00*	*$2.081,25*	*$2.092,50*	*$3.915,00*	*$3.858,75*
Cash Flow:					
Net profit	$5.805,00	$2.081,25	$2.092,50	$3.915,00	$3.858,75
Depreciation	$50,00	$50,00	$55,00	$60,00	$70,00
Cash flow	*$5.855,00*	*$2.131,25*	*$2.147,50*	*$3.975,00*	*$3.928,75*
Payback Local bank	$100,00	$100,00	$100,00	$100,00	$100,00
money for new investments	$5.755,00	$2.031,25	$2.047,50	$3.875,00	$3.828,75
money spent on new investments	*$0,00*	*$50,00*	*$50,00*	*$100,00*	*$100,00*