Spatial Characters of Fifteen Library Makerspaces in the Netherlands

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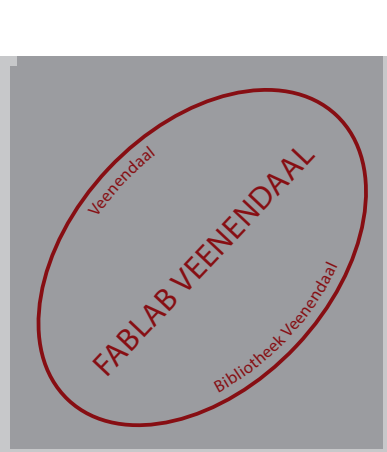
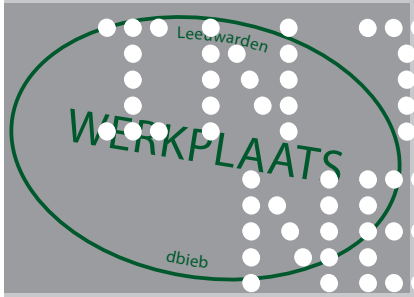


ATLAS MAKERSPACES IN PUBLIC LIBRARIES IN THE NETHERLANDS



Atlas: Makerspaces in Public Libraries in The Netherlands dr. Olindo Caso ir. Joran Kuijper

ATLAS

MAKERSPACES IN PUBLIC LIBRARIES IN THE NETHERLANDS

dr.Olindo Caso

ir. Joran Kuijper

Colophon

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Spatial Characters of Fifteen Public Library Makerspaces in the Netherlands

dr. Olindo Caso

Remarkably little information exists on the spatial issues associated to makerspaces in public libraries. An exception is given by the recent study of Theresa Willingham (2018) that reports about spatial issues when initiating a makerspace in a library. Among the spatial aspects of makerspaces design, after allocation of space and the floor plan Willingham mentions: accessibility and usability; lighting; power distribution; storage; safety and security; adaptability. Willingham's study is an useful guide for initiating a makerspace. It includes practical suggestions and good practices, and for this it is a recommended reading.

Nevertheless, a comprehensive study is still missing of such spatial and design aspects – even more when these aspects involve architectural design, thus not just limited by the pragmatism of the makerspace functioning. This missing information does not escape the Dutch context, notwithstanding the detected impetuous growth of makerspaces in public libraries (KB 2018). The information could be obtained empirically, from the choices made by designers of the many library buildings that have been recently realized and that include a makerspace. Alternatively, this information can be obtained from the experiences done by many libraries in their quest of initiating a makerspace in their own branches. This last is the direction chosen in this inquiry, through the empirical observation of a number of settled library's makerspaces in operation.

Accordingly, this chapter addresses the spatial characters of the fifteen makerspaces in Dutch libraries that have been the object of the field investigation in this project and that are mapped in the previous chapter, the Atlas. In doing this, the spatial and design aspects taken into consideration are:

- The relationships with the external urban space: visibility and presence;
- The accessibility and reachability of the makerspace inside the hosting library: clarity of the routing, obstacles;
- The position of the makerspace in the hosting library: which floor, is it central or peripheral located;
- The relationships with the makerspace's surrounding services and programs;
- The configuration of the space: its form and setting (closed or open);
- The actual size of the makerspace: is it L, M, or S?;[1]
- The flexibility and adaptability of the makerspace, the degree at which the makerspace can adopt different configurations in time;
- The possible availability of ancillary spaces, e.g. for storage, meetings, workshops;
- The spatial interventions and modifications due to the makerspace's technical equipment, like additional air-filters, chimneys, sound barriers and similar artefacts;
- The design specificity of the makerspace: generic space vs. specific space; the envisaged target group.

1 Large, Medium, or Small according to the distinction made when selecting the case studies, resp.: > 70m^2; 30 m^2 < 70 m^2; < 30 m^2, see scheme at p. 37. The selection has been made on the basis of the information supplied by the libraries at a survey (KB 2018). The empirical observations by inquirers not always matched that supplied information.

Rather than being exhaustive, this list addresses the different scales at which the spatial aspects can be observed: urban, building, interior, detail, installation and equipment. The goal is to enlighten the similarities and differences among the experiences, what are the generic choices made (by the most libraries) and what are the specific choices (made by one or by few libraries). The observations provide the materials for a critical discussion informed by the inquirers' expertise and disciplinary backgrounds.[2] These critical considerations and the expectations for the future inspired a brainstorm on the spatial conceptualization of the future of the makerspace in library setting. Accordingly, the following paragraphs are informed by a raising speculative content and respectively address:

1: The generic and specific spatial choices made by public libraries in initiating the makerspace: comparison of empirical findings;

2: Critical considerations about these generic and specific choices and about the observed patterns: informed discussion;

3: Possible scenario's and work hypothesis for the (future) design of the makerspace in library setting: a speculative brainstorm.

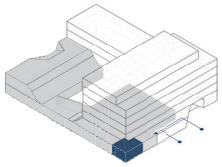
2 Among the others: Architecture; Architectural and Urban Design; Spatial Relationships; Typology and Composition.

1. Generic choices and specific choices

This paragraph compares the spatial aspects in the observed fifteen libraries in order to enlighten similarities and differences, generic and specific approaches / spatial solutions.

Library hierarchy and branches

OBA branch Slotermeer.

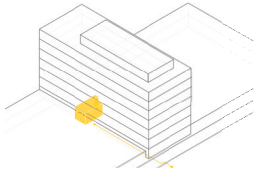


In the last years the library system in the Netherlands has known a merging dynamic by which public libraries in adjacent areas have been combined into networks. The larger library in the network (usually the one related to the most populated area) assumed the administrative task of main node in the local public library network.

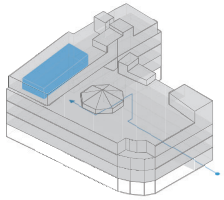
All visited makerspaces are located in library buildings (both autonomous library buildings or buildings that host a library among other functions) that are main nodes in their own library network/territory, excepting the three visited libraries in Amsterdam that are neighbourhood branches of the Amsterdam Public Library (OBA *Openbare Bibliotheek Amsterdam*). Eindhoven's makerspace is also an exception as it is an autonomous space (yet part of the Eindhoven library system), physically detached from a library building and somehow a branch in itself.

In the larger Dutch cities library policies for inclusion address the (potentially) 'lagging behind' social groups by reaching out to the neighbourhoods through (dedicated) library branches of the main library headquarters. These local branches are therefore very important for library engagement towards all citizens, in particular the less favoured groups. For this, OBA said to take advantage of the local library network to implement makerspaces in these branches first, before eventually initiating one in the main central library building.

Eindhoven library makerspace is located at the Microlab.



Utrecht library will move soon to a new accommodation.



The LocHal in the Tilburg Spoorzone is the new place of Tilburg public library. *Image, Mecanoo.*

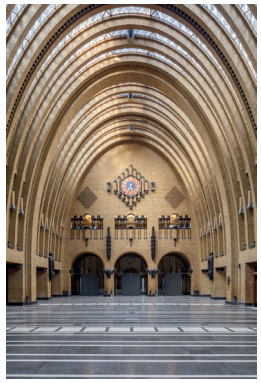
Permanent or temporary

All visited makerspaces are intended to be permanent, excepting Eindhoven's which is temporary. This experiment will be evaluated according to its specific ambition of making connections with the creative business (it is hosted by the Microlab, a creative industry hub) and according to the role it can play in the further urbanization of the former industrial area in which it is positioned (the Philips/Strijp areas) as initiator of the local neighbourhood branch.

'Permanent' here refers to the offer of the service, not to the position of the makerspace in the library or to its spatial configuration, which can change in time. Two libraries will move to a new accommodation soon as construction is advancing: Utrecht will move to the monumental former post-office building at Neude – here the makerspace will be located at the side of the main entrance according to floorplans, obtaining visibility from and to the urban space; while Tilburg library will move to the LocHal, a former service building in the railway redevelopment zone, in the proximity of the main train station. In the actual concept the new Tilburg library at the LocHal will address a great deal of 'making' possibilities. Mecanoo Architects is one of the designers engaged in this Tilburg library project.

Other libraries too are considering relocating their makerspace within the own perimeter, yet no plans were officially released at time of site-visit. In the case of Steenwijk, however, the makerspace is going to be moved next to the main entrance at the ground floor leaving the present location in the windowless basement. The (mostly) volunteers staff welcomes very much this change.

The former post office at Neude will host the new public library of Utrecht. *Image, ZECC Architects.*



Makerspace in Steenwijk library is located at the basement floor. *Kuijper.*

Type of makerspace

Leeuwarden public library hosts a Lego makerspace. *Kuijper.*

Makerspaces in the Netherlands have been inspired by different models.[3]

Four makerspaces among the visited are FabLabs (at Apeldoorn, Breda, Middelburg and Veenendaal) offering opportunities based on the FabLab 'open source' philosophy and connected to the FabLab network; one (in Leeuwarden) only offer special educational Lego programs; while the remaining ten are generic makerspaces. These ones mainly offer digital or digital-based making (coding, programming, 3d printing etc.) as the crafting opportunities are limited.

Eindhoven seems to offer more tinkering possibilities than the average of the visited ones (variety of tools available), and Amsterdam Waterlandplein says to integrate these two modalities of making. Tiel's makerspace is especially devoted to digital making opportunities (coding, robotics).

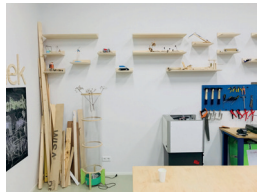
Breda's library also hosts music and art schools: here the FabLab is one of the (cultural) opportunities offered by the library, but no evident connection between FabLab and art schools have been observed by inquirers.

In terms of space, no much differences have been detected between the different models. Lego and coding-only programs do not need special equipment for crafts like soldering or for digital-supported making like laser cutters and 3d printers (plus the necessary additional installations), equipment that is in general present in the other visited makerspaces. In general, the visited makerspaces promoted a digital / innovation-directed type of making, while the traditional crafting possibilities have been discussed less.

Tiel makerspace is devoted to digital making. *Kuijper.*

3 Read footnote 7 at p. 16 for a definition of different types of makerspaces.

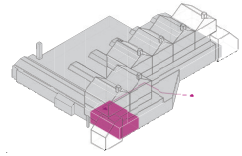
Tools for wood-working at makerspace Eindhoven. *Caso.*



OBA branch Waterlandplein offers different making opportunities. *Kuijper.*

Relationship with urban space

The most makerspaces in libraries are not visible from the urban public space. Among the visited only ’s-Gravenzande, Tiel, Amsterdam Slotermeer and Amsterdam Waterlandplein have an obvious visible connection with the external public space. Zwolle and Middelburg are also visible, but this experience is not very significant in urban sense (Zwolle’s maker-space faces a parking lot and Middelburg faces a large waterway).



Library makerspace at ‘s-Gravenzande is visible from the street.

Amsterdam Waterlandplein is the only makerspace among visited with an own direct entrance from the urban space. Amsterdam Slotermeer is almost in the same situation but indirectly, as visitors do not have to go through the library (or through the adjacent coffee bar) to access the makerspace. This makerspace is located at the border between the different social institutes hosted by the multifunctional building ‘De Honingraat’, which has several entrances. This space was initially thought-of as a hinge between the library and the coffee bar; now it hosts the makerspace. Also the Leeuwarden library’s makerspace has a second own entrance, although not very visible.

OBA Waterlandplein makerspace has an own entrance. *Kuijper.*

View towards the street from the makerspace at OBA branch Slotermeer. *Caso.*

Terrace facing waterside at Middelburg, exterior and interior. *Caso.*

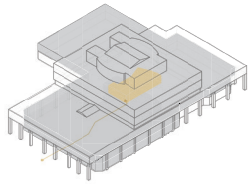
None among the visited libraries has an own outdoor open space which could serve as a connector between the city and the library, surely not the makerspaces. The only outdoor space belonging to a library that a makerspace could use have been found in Middelburg. Though, this space lays at a not publicly accessible waterfront, and is likely to stay hardly accessible for the library visitors, probably for safety reasons. It is indeed a terrace that was probably intended as a pleasant extension for the Auditorium's foyer. At Breda the makerspace lays adjacent a nice, green courtyard that can provide interesting spatial opportunities.

Zwolle makerspace overlooks a parking lot. *Caso.*

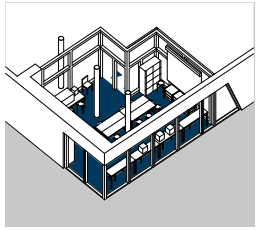
Position in library

All makerspaces have been given a peripheral location in the library, excepting Tilburg which is located right amidst the library in an open setting, on the first floor, there were previously an information desk was positioned. However, this condition of being peripheral is nuanced and acquires different meanings according to the specific situation of the library. In fact, although positioned in a 'corner' of the library the makerspaces of Breda, Veenendaal, Utrecht, Apeldoorn, 's-Gravenzande, Amsterdam Slotermeer and Tiel hold

Tilburg Digilab.



Makerspace of OBA branch Slotermeer has transarent walls towards both the library and the street.



direct (visual) relationships with significant parts of their hosting libraries, mostly due to an open setting or a transparent materialization. The other makerspaces are felt more peripheral in the own library due to harder separations (like the materialization and/or a location away from core areas of library). The choice of at which floor to locate the makerspace also plays a role at this regard.

The position also influences the degree of spatial integration in the library as experienced by the inquirers on the basis of position, internal physical and programmatic relationships, visibility and routing.

A fully transparent waal separates the makerspace from the library at Veenendaal. *Kuijper.*

Program proximity

The position of the makerspace in relation to other services in the visited libraries is typically adjacent:

- The (book) collections (Tilburg, Amsterdam Waterlandplein, Veenendaal, Utrecht, Breda, Tiel);
- The study areas (Apeldoorn, Tilburg);
- The meeting rooms/auditorium (Zwolle, Amsterdam Reigersbos, Middelburg, Apeldoorn);
- The library's offices (Amsterdam Reigersbos);
- The PC work-stations and study areas (Tilburg, Tiel, Apeldoorn, Amsterdam Slotermeer);
- The art-lending section ('s-Gravenzande);
- The dedicated children area (Apeldoorn, 's-Gravenzande);
- The reading table ('s-Gravenzande).

's-Gravenzande Bieblab is adjacent the reading table and the art lending. *Kuijper.*

Furthermore:

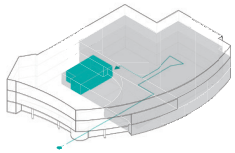
- No makerspace is connected with a library's café or a coffee corner but at Amsterdam Slotermeer, where the café is close-by;
- Leeuwarden makerspace has its own dedicate space, still the collections extend to the makerspace. This was decided later, yet the organizing team of the makerspace would rather prefer to have no collection in that room;
- Steenwijk's makerspace is not adjacent to any other library function due to its isolated position in the basement;
- Eindhoven has its own specificity of being detached from the library. It neighbours the offices of creative industry to which the hosting building Microlab is dedicated.

Routing and reachability

Interior OBA branch Reigersbos. *Caso.*

When makerspaces are not visible from public space or from entrance/information desk, they need efficient wayfinding. This is not always easy as routing to makerspace in the library can be complicated. Steenwijk's makerspace for instance is difficult to find because of its location in the basement. Leeuwarden's makerspace is located at the end of a long route through the library. This makerspace can be accessed by two sides, of which one side is not part of the library, but likely not every visitor knows it. To use the second entrance the visitor has to enter another part of the multi-purpose building than the library. In the case of Zwolle, there is just a small signage on the makerspace's door pointing out its location in the hallway with other similar rooms. Amsterdam Reigersbos has tried really hard to point out the makerspace's peripheral location in the library by means of good signage and wayfinding; yet it is located one floor up next to the library's offices.

Position of makerspace in Steenwijk library.



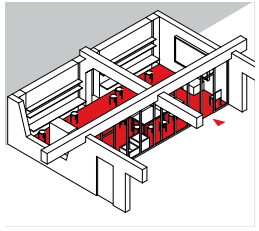
Accessibility

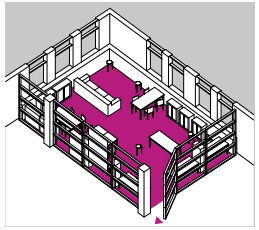
No severe accessibility issues have been detected e.g. regarding disables and elderlies although positioning a makerspace on floors other than the ground-floor is not a favouring condition when it forces some categories of visitors to use a different routing and/or an elevator. This last could in turn affect findability/visibility.

Makerspace setting

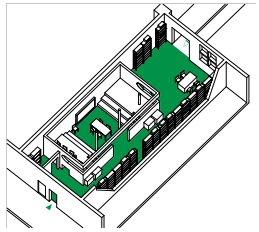
Most of the visited makerspaces are located in a closed setting, meaning physically separated from the overall library spaces by a door. This is the case in Veenendaal, Zwolle, Amsterdam Reigersbos, Amsterdam Waterlandplein, Amsterdam Slotermeer, Apeldoorn, Steenwijk, 's-Gravenzande and Eindhoven (although for this last could not be otherwise being it physically detached from the library building). These makerspaces show a transparent (glass) façade towards the library excepting Reigersbos (in office area), Waterlandplein (hard separation: wall), Apeldoorn (only the entrance is transparent), Steenwijk (in basement). Leeuwarden makerspace is more a hybrid setting between open and closed, because of the collections extending into the dedicated makerspace room. Makerspaces in Tilburg, Middelburg, Breda, Utrecht, Tiel are all configured in open settings.

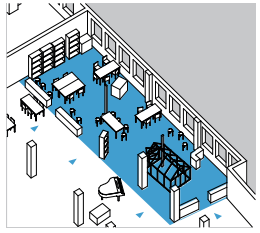
Closed makerspace setting at Veenendaal and 's-Gravenzande (below).





Hybrid makerspace setting at Leeuwarden.



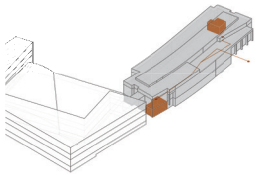


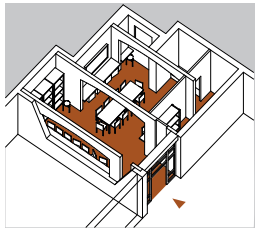
Open makerspace setting at Utrecht.

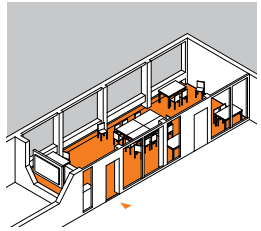
Number of spaces

The makerspaces are generally located in one single room, yet they often enjoy ancillary spaces. A separated storage space serves the makerspaces at Apeldoorn, Amsterdam Waterlandplein (behind curtains), Breda, Eindhoven, Middelburg, and Leeuwarden. All

Position FabLab and VRLab at CODA Apeldoorn.







Regular-shaped makerspaces at libraries Zwolle and Apeldoorn (above).

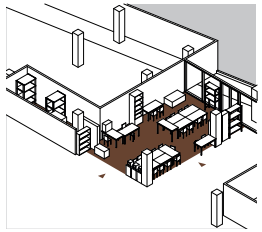
other makerspaces use (lockable) racks and cabinets to store materials and equipment. Middelburg and Breda are open settings equipped with a closed storage. Amsterdam Waterlandplein has also its own toilets and a small pantry, due to the previous retail function of the space it is located in. Also Leeuwarden has a water tap. CODA Apeldoorn holds a second special space dedicated to Virtual Reality (VRLab). These two labs at Apeldoorn are located at the two sides of the basement, separated by the children area and the study area. When extra capacity is needed, the makerspaces can use a close-by meeting room, if available. This is common practice at Tilburg, Veenendaal (but one level below), Apeldoorn, Tiel (but one level above), Middelburg and 's-Gravenzande.

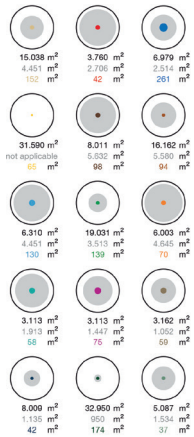
Shape and size

The form of the space is generally regular. This is also the case in open settings as the standard area of the makerspace can be usually good felt/identified. Makerspaces in closed settings have all a rectangular form, being (former) rooms that are refurbished to host the new functionality. More complex room-shapes have not been detected, excepting Apeldoorn which shows some more articulation in bay-areas. The few irregularities in floor plans usually accommodate storages or similar purposes. Without considering those ancillary spaces external to the makerspace area (like rooms for workshops and meetings), the size of a makerspace varies from 261 m² (Breda, open setting) to 37 m² (Tiel, open setting) with an average size of 100 m².[4] The makerspace accounts for a small percentage of the total library space, typically between 1.5% and 4%. The case

4 Data resulting from own empirical observations and measurements. These data often differ from the information supplied by the libraries in the context of the initial makerspaces survey (KB 2018).

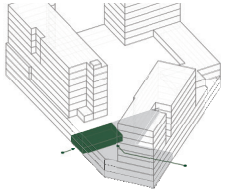
Middelburg library makerspace has a closed storage space and an open setting.





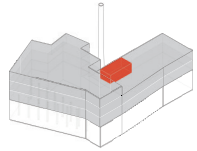
Comparative table building, library, makerspace m².

The makerspace takes a large share of OBA branch Waterlandplein.



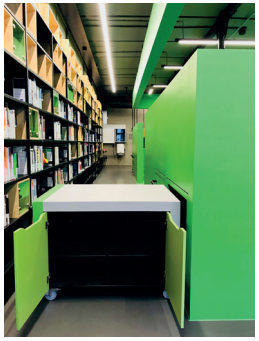
of Amsterdam Waterlandplein is remarkable at this regard. Here the makerspace takes more than 18% of the total surface of this branch library, in turn reflecting the makerspace ambitions of this branch. The smallest percentages have been measured in Veenendaal and in Zwolle: 1.5%. The ratio between makerspace surface and number of workplaces[5] is also very diverse, ranging from 2.8 m² per workplace (Amsterdam Slotermeer, Veenendaal) to 10.8 m² (Tilburg). However, these figures can be easily altered by the possible use of ancillary space in peak moments.

The makerspace at Veenendaal takes 1.5% of the total library surface.



Flexibility and adaptations

Spatial and technical adaptations/modifications have been apparently not necessary for initiating a makerspace. Most of the potential interference problems can be solved by time-planning and by reciprocal acceptance within the library. Furthermore, (small) silent rooms are generally present in public libraries. Machines like laser-cutters, vinyl-cutters and 3D printers are not very noisy. They are standard equipped with a filter to gather smoke and dust. Nevertheless, Breda has an additional chimney for the makerspace area. Because of the number of machines that populates the makerspace, including lap-tops and mobile devices, all settings show a large availability of power sockets and have to cope with overwhelming cabling, that can be embedded in (smart) furniture or led along plinths, under the carpets or floating pavements.



Storage embedded in furniture at Leeuwarden dBieb. *Kuijper.*

All makerspaces are rather flexible in their organization, yet in different ways. In closed settings tables can be moved around and organized differently according to the type of activity; in open settings, when makerspace is not in operation the spaces/tables can be

Laser cutters and others are equipped with a filter, like here at Apeldoorn. *Caso.*

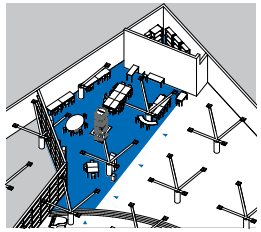
5 Figures calculated by inquirers after observations on site.

occupied by regular library visitors while extra tables can be used by the makers when in operation, if necessary. For both situations, the availability of ancillary spaces like workshop rooms, meeting rooms, auditorium helps to manage the peak moments.

Children produce quite some noise when they are absorbed in a makerspace activity, like (educational) gaming and VR. In 's-Gravenzande the makerspace door can be closed in such cases to minimize disturbance for the nearby reading table. This makerspace is pretty small and filled up with machinery and computers (and even a couch), therefore becoming quite crowded especially at days when children have no school.

Workplaces at Utrecht 'Laboratorium' can be used by others in times of low venue. *Kuijper.*

Makerspace at Breda library. Tables are available for all visitors when not in operation.

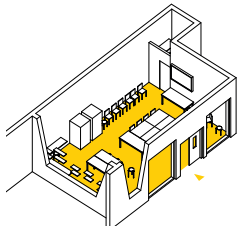


Target groups and space

All makerspaces can be used by all library visitors at opening times. Some staff members have a key of both the makerspace (where applicable) and the library to possibly close-off after regular library opening times – for example when a *hackaton* is held or tasks of 3D printers or laser cutting machines have to be finished (Steenwijk). Of course, this possibility depends on the spatial setting and the borders situation in library (open/closed; independent entrance or not; and similar conditions).

Rather no visited makerspace seriously addresses (local) entrepreneurs, although the ambition of doing so exists. Eindhoven's position at Microlab should facilitate relationships with creative industry, but this is yet to be proven successful. Zwolle offers the makerspace to everybody (also external) and thus to entrepreneurs too, at the condition that the users organize activities that are also valuable for the community. Indeed, this library profiles itself as well as a centre for the community. Veenendaal stated that entrepreneurs would probably need a more professional making space than in library setting.

The Microlab, a creative industry hub in Eindhoven. *Kuijper.*



Eindhoven library makerspace at Microlab.

Another target group that is often addressed is the teachers' education (like in Veenendaal and Apeldoorn), with courses about the use of the equipment, coding and programming, and specific education programs for students and children.

Yet, the main target group is the children of elementary school age. Several makerspaces also explicitly address teen-agers and adults. This is the case at Tilburg, Apeldoorn, Breda, Middelburg, and Steenwijk. Elderly people make use of makerspaces as well, mostly for getting acquainted with the 21st century skills (learning how to use tablets and computers) through dedicated meetings organized by the hosting library for this particular target group. Tiel library makerspace organizes activities for elderly people on Wednesdays, in the morning. A group of elderly customers regularly visit Steenwijk's makerspace for hobby, mostly crafts oriented (soldering and 'old fashioned' hardware computer pioneering with circuit boards for example).

The addressed target groups seem to have little influence on the way the makerspaces are designed – maybe the exception is Leeuwarden for the materialization and the design of the interior oriented to children and Lego making experience.

Children gaming at the 's-Gravenzande BiebLab. *Kuijper.*

Children visiting a workshop at Tiel MediaLab. *Kuijper.*

2. Considerations

This paragraph reports considerations and reflections on (critical) aspects detected through empirical observations, staff interviews and mapping; and further elaborated by means of analysis and discussion sessions, including a workshop event with a makerspace experts' panel[6] organized at the Faculty of Architecture and The Built Environment of the Delft University of Technology.

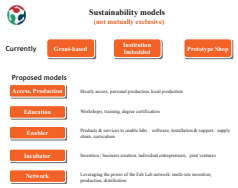
General considerations on conceiving a makerspace in the context of the public library

0. The true value in the landscape of makerspaces in public libraries resides in their people, the staff pro-actively animating the making experiences with enthusiasm, ideas, ambitions. They learn further and develop (new) programs, they make tests and share with peers. They believe in open access and in libraries as centres of future literacy. They, and all the motivated makers, deserve spaces that can match their dedication and that can help them in inspiring, sharing, co-creating, connect across experiences, both digitally and physically; spaces that are designed with the ambition of being the cradle of future society.

However, current modalities of budget allocation for public libraries generally allow for limited investments in makerspace (and in particular in its architecture), by which the

6 Workshop held 2018, August 27th. Participant experts: Reda van der Putten (Bibliotheek Eemland, regio Amersfoort) Peter Troxler (Hogeschool Rotterdam), Eva Visser (Hogeschool Rotterdam), Mirjam Albers (Cubiss), Ingrid de Jong (Cubiss), Carola Oortwijn (Rijnbrink), Emma Bijl (Rijnbrink), Jeroen de Boer (Bibliotheekservice Friesland), Aan Koostra (Bibliotheekservice Friesland), Jantien Borsboom (Digilab Bibliotheek MB), Elvira Caneda Cabrera (Bibliotheek-Informatiesector), Fedele Canosa (architect Mecanoo), Marianne Hermans (KB), Olindo Caso (TU Delft), and Joran Kuijper (TU Delft). See pag 39.

Models for economic sustainable FabLabs. *Boeck & Troxler (2011).*



equipment is an obvious priority. Sustainable business models for initiating a FabLab[7] have been proposed earlier (Boeck & Troxler 2011), in which the location into a public (library) institute scores good mainly due to the less expenses for staff and accommodation. A makerspace can also sustain itself by developing educational programs for supporting parent institutes, like the Frysklab has done (Boer 2015), or by accessing grants / sponsorships. At present, thus, the attention for the physical spatial conditions and design of makerspaces in library context takes a back seat. Yet the spelled out ambitions and the potentialities of library makerspaces in spreading digital literacy would deserve more investments also on the spatial side.

1. The definition of a library makerspace, what types are appropriate and consequently how to design them in accordance with the local library strategy or with a general, country-wide understanding, is not yet part of public library common ground. Creating a common understanding could be a task for the VOB (*Vereniging Openbare Bibliotheken*, Dutch Association of Public Libraries) and/or the KB (*Koninklijke Bibliotheek*, National Library of The Netherlands) as umbrella organizations, for clarifying the potentials of types of makerspaces for reaching strategic goals – yet considering the leading importance of the local specificities.

The SPN (*Samenwerkende POI's Nederland*), an organization joining the nine Provincial Supporting Institution in the Netherlands, has the statutory task of innovating the Dutch library sector. One of the actions comprised under 'Personal Development'

7 These models are indeed thought for FabLabs, however the logics behind the argumentation can be extended to makerspaces in general.

concerns the 'workplace',[8] which focuses on digital literacy and making in Dutch libraries. Also this workgroup could contribute to clarify framework and boundaries of makerspaces in Dutch public libraries.

Presently, the main motivation for libraries to initiate a makerspace lays in the choice to render 21st century skills accessible to all. What this exactly means (and how this could evolve with the ever-changing perception of what is required as skills for the 21st century and beyond) did not become clear to the inquirers during the field work, consequently affecting the inquiry issue of the physical form (the design) of makerspaces in relation to a given set of strategic goals. This does not mean that to start a makerspace was an uninformed initiative of the observed libraries. For this they correctly looked into available precedents and settled experiences, learning by and collaborating with successful enterprises like the Frysklab[9] (Willingham & De Boer 2015).

However, while making and makerspaces are internally highly promoted the libraries are still ambiguous in their goals and are likely in search of a more precise framework for the new service for now and for the future.

New literacy. Dedicated VRLab at CODA Apeldoorn. *Caso.* **3d printers at Breda Makersbase (below).** *Kuijper.*

2. The visited makerspaces especially engage into 'innovation': the digital skills for the 21st century. Clearly less attention was detected for 'creation' (art & crafts) across the inquired pool.[10] There exist more libraries in the Netherlands which offer arts & crafts making but

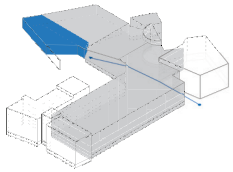
8 Visit: https://www.stichtingspn.nl/persoonlijke-ontwikkeling

9 Visit: http://www.frysklab.nl/

10 The distinction between 'innovation' and 'creation' is made according to Jochumsen (et al. 2015), as two sides of the same 'performative space' coin. The approach of many Dutch library's makerspaces is a learning-based one, in this (as well) fitting the 'learning space' of Jochumsen's (et al. 2012) 'Four-Space model' (see p.13).

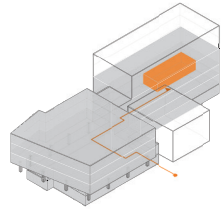
Cultural merging: Eemhuis Amersfoort is an example of cultural centre typology hosting as well art schools and archives. *Caso.*

they were not part of the visited sample. Because the case-studies were selected among the libraries interested into further participation in the project, this detected difference of attention is probably due to the concerns most libraries presently share about understanding position and potentialities of digital makerspaces in library environment. On the contrary, arts & crafts making already knows a longer history in libraries and are felt more connected to amusement than digital making, which is in turn associated to 'learn', likely calling for more 'structured' approaches. Probably the visited libraries were more interested in discussing and showing the digital making possibilities. However, whether this distinction is functional to the aim of spreading 21st century skills is difficult to say, yet it is doubtful. We suppose that the claimed required skills are not only technical, but rather of generating a culture of creative, pro-active learning and entrepreneurial attitude – and these skills can be as well provided by art & craft making (creation). At this concern the Amsterdam Waterlandplein branch is an interesting example as it supports a wider range of making possibilities and connects the two performative modalities.



Breda library shares its accommodation with art schools and other cultural institutes.

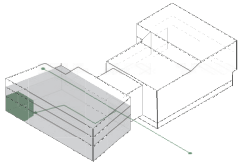
3. Most of the visited libraries (Veenendaal, Zwolle, Breda, Middelburg, Amsterdam Slotermeer, Tiel, Eindhoven, Apeldoorn and Leeuwarden) are presently part of cultural clusters/centres. This is a trend which is increasingly taking place in the Netherlands, in which the library and other (subsidized) cultural services are brought under one roof, with more or less hard borders and a more or less integrated management.[11] This trend is often related to the optimization of public resources and to the growing ambition by local governments of strategically employing culture (Skot-Hansen et al. 2013). At the same time,



Zwolle Stadkamer also hosts education, cultural community, event space.

11 Recent operations of this type in the Netherlands are Rozet Arnhem; Eemhuis Amersfoort; OPEN Delft (former DOK).

Also Tiel library is located in a multifunctional cultural building.



it also relates to the need of cultural services of repositioning themselves (Vallet 2013) in a changing society and in a changing cultural landscape that is increasingly made of hybrid cross-fertilizations (Lessig 2008) and is inhabited by prosumers (Sacco 2011; Ritzer 2012). In these new configurations the makerspace can still be part of the library (or of one other participating cultural institute) or can become part of the building as an institute on its own. This development may suggest in the future new ways to arise of being a cultural oriented makerspace in a contemporary setting of culture-city relationships, with changing, more sophisticated requirements for equipment, for design and for space and a renewed relationship with the library institution.

Makerspace visibility, organization, design and position in library context

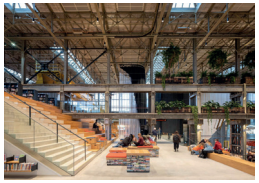
4. No own outdoor space is available for makerspaces in libraries. This affects the ability of libraries to create a significant transition space between library public building and urban public space (Giles et al. 2014) that could become a showcase for the library and for the makerspace itself. Additionally, an outdoor space could offer to a makerspace room to extend making-programs, e.g. including gardening and growing/culturing crops; or for teaching the basics of building and construction (for example making a small garden shed) – which could be relevant in certain areas.

5. Referring to the observed cases, the spatial aspects and the specific design of the makerspaces seem not to be seriously addressed among the strategic choices of planning and starting a makerspace. The position of a makerspace in a library apparently derives more from opportunistic considerations than a well-thought strategy. Mostly the

makerspaces are located there were the library could more easily make room for them, sometimes resulting in difficult spatial conditions.

This is understandable and it is a pragmatic manner to get started,[12] yet the question remains of whether a more developed design of the makerspace could boost the value of the operation by creating well-thought, inspiring spatial interfaces between users and makerspace service.[13]

6. The detected spatial indifference regarding position and design of the makerspace is probably due to the fact that a makerspace is a recent addition to the library program and is not yet established as (architectural/spatial) typology inside the library building. This differs from already integrated services as the collections, the auditoria or the art schools that already know a longer tradition in the spatial configuration of the public library. For this, the makerspace seems to be presently considered as a space-neutral institute which is at the moment best served by generic solutions.



Tilburg, LocHal. The 'KennisMakerij'. *Image, Mecanoo.*

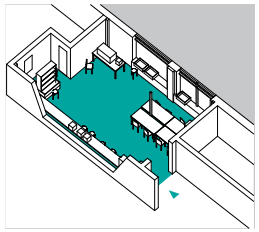
It will be interesting to see which place will be given to making in the next library buildings, like for instance the new Tilburg library at the LocHal where 'making' opportunities are explicitly included into the building program.[14]

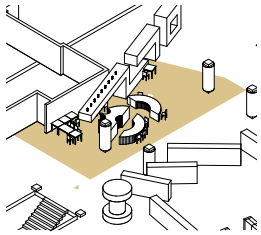
12 With minor exceptions, the budget for running a public library is notoriously limited. The focus lays then on the programming, the staff and on the necessary machines – hardly on high-quality spatial design.

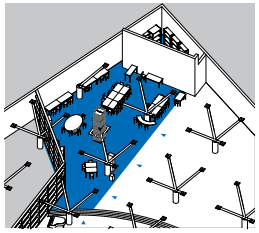
13 Among the 'Design and Development' guidelines for re-envisioning New York's branch libraries, Gilles (et al. 2014) suggests to "*invest in joyful spaces*": "*vibrant spaces that inspires creativity and fosters sense of discovery*" (p. 52). This seems especially appropriate for makerspaces design.

14 From the website of the design architect Mecanoo (https://www.mecanoo.nl/Projects/project/221/LocHal): "*LocHal has seven uniquely designed themed rooms for specialized work, research, learning and collaboration: Digilab, Game Room, Living Library, Knowledge Workshop, Time Lab, Dialogue Room and the Writing Room*".

At the Steenwijk library the makerspace is located at the basement floor.







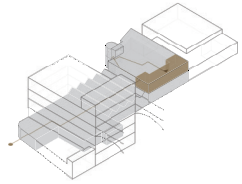
Tilburg (above) and Breda have no standard design.

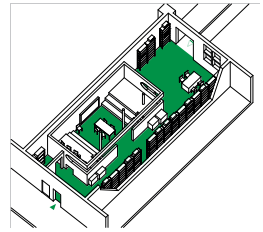
7. In consequence of this opportunistic strategy, some makerspaces were located in the (sometimes windowless) basement[15] (Steenwijk, Middelburg, Apeldoorn) or in places with complicated reachability (Amsterdam Reigersbos, Leeuwarden, Steenwijk) that many makerspaces (staff) would be happy to escape. At the same time, the presence and offer of makerspaces in visited libraries is often not evident in space, notwithstanding all the advertising screens and the boards and the signage and the wayfinding tactics employed. By this, makerspaces scarcely promote themselves in a visual way or act as a showcase for themselves and for the hosting library. Visitors must be then informed in advance about the offered possibilities and must already know about their location in order to find them. This usually happens through (local) newsletters, much less by visual/contextual means.

8. The design of the makerspace is basically the same in all visited situation, excepting experiences like Tilburg (open desk at the centre of the library) and Leeuwarden (dedicated design for Lego users). Breda too paid attention to the design of the makerspace area: a local artist configured the interior by low-budget intervention, (re)using common/cheap materials.

The detected spatial neutrality could constrain the realization of makerspace programs, because the spatial form/organization could affect certain tasks. For instance, as makerspaces mainly claim the educational goals of digital literacy, it could be interesting for their spatial organization to learn from school architecture in which different floorplan

At OBA branch Reigersbos the makerspace is located at the first floor.





Leeuwarden library makerspace has an own identity.

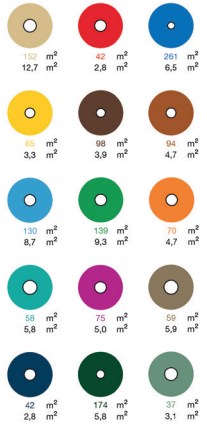
15 Being located in a basement is not per se a negative spatial condition. It could even stimulate an ‘underground’ identity, a own micro-culture which could appeal some categories of users (e.g. teen-agers). Yet it should be strategically conceived and designed for this aim.

Three typologies for learning spaces in schools. *Coen de Vries, TU Delft student.*

articulations can support the educational purposes in particular for what it concerns the balance between group work and individual work (and creative work) (Schneider 2014).

The uniformity of the most makerspace configurations is apparently in conflict with the public library orientation towards local embedment. It could have been expected library's makerspaces to contribute to local identity and to a specific making context for/by own users, therefore reflecting the diversities among territories and the individuality of the place.[16] Some of the visited libraries are in the same building as the local city archive (Veenendaal) or a museum (Apeldoorn) evoking a local identity and possibly stimulating cultural exchange. How could the makerspace gain from this presence?

9. Although some makerspaces can count upon ancillary spaces, generally when the number of visitors reaches a peak they still struggle with size. How big should a makerspace be? Willingham (2018) suggests workshop areas of about 7 m² to 9 m² per person. In comparison, the observed cases in the Netherlands show lower values per workplace, typically from 3 m² to 6 m², with an average of 5.4 m² per workplace across the inquired panel.[17] However, it is not always useful to dictate hard figures for library makerspaces, but for general orientation. A well-balanced system in which makerspaces might grow or shrink according to moments (typically a hard core surrounded by more hybrid workplaces) seems to be a realistic possibility also in order to avoid annoying vacancies in times of not-operation or low venue. However, the impression is that in general the actual

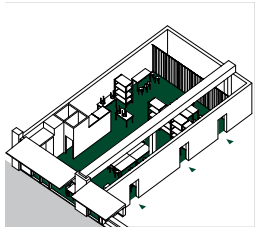


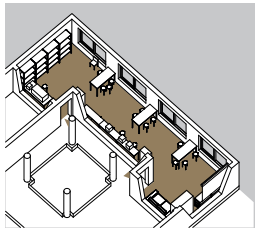
Comparative table makerspace workspace m².

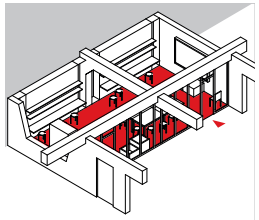
16 Also in terms of community engagement. For example, in the 'City of Amsterdam' users of makerspaces are challenged to think about the city's configuration during urbanization games. Local community awareness is part of this program and tries to involve (young) people into local initiatives created by the City of Amsterdam's planning bureaus.

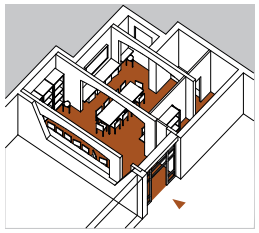
17 Values calculated by the inquirers after empirical observation on locations.

Closed makerspace settings.









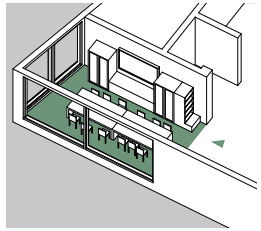
library makerspaces are rather small areas which hardly have the potential to generate a positive spatial engagement (presence, activities) with other library services.

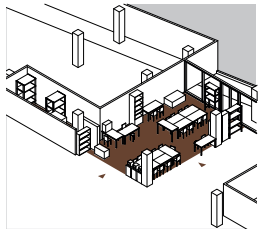
10. The most makerspaces are configured in closed setting – this is typically a room separated from the rest of the library. The advantages offered by a closed configuration above an open one relies on: the possibility of creating distinct dedicated area, the managing of the potential noise (think of a group of loud children) and the protection of the equipment On the other hand, the makerspaces can become a ‘black-hole’ of vacancy inside the library in time of underutilization as many closed configurations show a transparent wall towards the library.

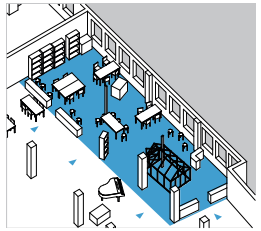
The open settings can be better appreciated for the greater possibility of mingling with the other library services, indirectly involve other visitors and act as a showcase. These spaces can informally grow or shrink according to the busy moments and when ancillary space is available. Disadvantages are the possible production of noise, the impression of ‘taking over’ the library, the need of spatial solution to ‘protect’ some equipment, (typically lockable furniture, more or less integrated into the design - see e.g. Leeuwarden), the preparation of the scene over and over again - for instance in the case of additional spatial arrangements which can take some time, like setting up a virtual reality environment.

An interesting spatial solution is the one in Leeuwarden which adopts a more hybrid configuration, with an overlapping zone between overall library program (collections) and the dedicated makerspace. For this a multi-purpose architectural object is placed in the room. In general, there seems to be opportunities for designing more complex spatial relationships between makerspaces and library space.

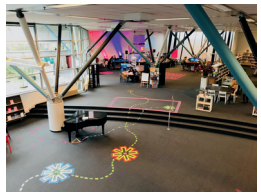
Open makerspace settings.



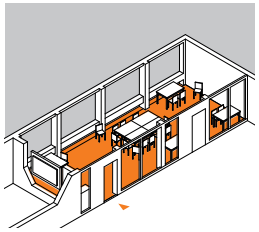




11. Spatially the most successful makerspaces, meaning those apparently better embedded into the library,[18] seem to be those holding a more visible location in library and/or in urban space, or that are better connected with another library service/offers/programming. Indeed a 'better' location in own library, possibly close to entrance and good visible from urban space, is broadly desired by the inquired makerspace staffs – those persons which are daily busy with running the service. Several visited libraries have now plans to relocate the makerspace to a more visible or central location, in this starting to recognize a higher value to their library makerspace. It will be interesting to see which criteria and goals are set for the relocation plans, and whether the relocations will go together with more ambitious designs.



Breda makerspace is well visible from the entrance area. Colors and wayfinding carpet art make it attractive. *Kuijper.*



Zwolle makerspace is located in a corridor together with other similar generic spaces. *Caso.*

Spatial aspects related to the makerspace programming in library context

12. At the moment the makerspace seems to hold weak relationships with the other services/offers/programming and with the collections. Libraries are rather organized in self-referring entities, like islands, and do not seem to gain much added value from their increased programmatic complexity. The impression is that the makerspace is still felt as an 'addition of a stranger' to the library organigram instead of being an integral part of it. A library strategy of internal programmatic cross-fertilization is still in its infancy, and this is especially true for the introduction of the makerspace.

A spatial approach to these potential cross-relationships could lead to more interesting design solutions that could inspire a more fertile anchoring of the makerspace in the library (Levien 2011).

18 Thus in spatial sense, not measured by popularity/venue.

Tilburg DigiLab is located in-between different library services, at the centre. *Kuijper.*

13. The wanted relationships between the makerspace and the library program are often twisted. This also holds for the focus of the library in general and the makerspace in particular. For instance, some consider an explicit relationship/link to the young/children space as desirable, because the makerspace activities are more often directed towards that target group; others are just willing to escape this relationship, being afraid to be labelled as a 'children affair' only. In general, a stronger structural spatial relationship with additional workshop/meeting spaces or auditorium confers additional strategic flexibility in operating the makerspace in different target group conditions, but it is not a sufficient condition. To establish successful space-program relationships is not simply matter of proximity but rather a matter of integral spatial design.

CODA library makerspace is located in the basement, besides meeting spaces, study spaces, an additional workshop room. *Caso.*

The spatial meaning for the community of the makerspace in library context

14. Structural active engagement of libraries in promoting the makers and the products of making (both innovation and creation) has not been detected among the visited makerspaces. Exploitation of the 'made' is scarcely helped and thus also not encouraged. In this the library could act more as e.g. a community 'marketplace' or like a participatory, co-creative platform (Hvenegaard Rasmussen 2016) offering makers the opportunity to stage own ideas to others. This could largely improve the status of making in library and community. An example for this could be the Demoteket initiative of Copenhagen public libraries (Jochumsen et al. 2015) which aims to include the products of library users (music, writings, movies, etc.) into the library collections – thus making them accessible to all. Another interesting example is the Library10 in Helsinki (Jochumsen et al. 2015), which

Helsinki Library 10 is specialized in music. *Image, found on Pinterest.*

is a library initiative largely devoted to performing.[19] At Library10 users can create, show and publish own cultural products. The library provides help and equipment for e.g. publishing a book, it has record-studio's and rehearsal rooms; it organizes many events and happenings, it is a stage for the local (cultural) community.

The 'Waiting Room' at Colchester has been inherently a community making place and a host for local events and a meeting point (Willingham & De Boer 2015). These examples stimulate a 'performative attitude' towards inhabiting the library – to which a dedicated design could offer an inspiring stage.

A music event at The Waiting Room, Colchester UK. *Image, https://metalrecusants.com/2014/10/24/...*

15. The visited makerspaces generally lament the lack of enough educated staff capacity for their functioning, which results in limiting the opening hours and the opportunities for the visitors to engage in a maker culture. Also, most makerspaces focus on primary school children and therefore they experience peak moments at no-school times. Spreading 21st century skills is a high priority of most of the makerspaces, but staff members should be trained for these goals. Several makerspaces enjoy the contribution of volunteers, but not every makerspace can easily find enough available volunteers. Networking across Dutch makerspaces and possibly the affiliation to international makerspace networks, if further implemented, could contribute to tackle these problems by facilitate appropriate staff training and by rendering assistance available online too.

19 Both Domoteket and Library10 are more directed towards the 'creation space' in the performative domain sketched by Jochumsen (et al. 2015). However also the innovation spaces can engage the community in a similar way. Concerning Library10, visit also: http://modelprogrammer.slks.dk/en/cases/inspirational-cases/library-10-helsinki/. Library10 recently moved to the new Helsinki central library.

Such a networking experience is apparently not part of the visited settings, at least not visibly and not for the users, and it is not expressed in spatial terms. The relationship between the (digital/digitally supported) networking and the lay-out/design of the physical makerspace could deserve more attention in the light of enhancing the experience of remote networking and make it visible, for instance by creating digital spaces as windows/gates connecting among physical realities.

The library makerspace in relation to the space of the user's individual performing

Staff assisting users at Medialab Tilburg. *Kuijper.*

16. Differently from the commonly self-directed practice of library services (self-helping: pick yourself a book from the shelf; self-check-in/out; make scans and copies by yourself etc.) the interactions with the machines in a (digital oriented) makerspace are mediated through the staff, because of obvious reasons of safety, misuse, lack of knowledge, complicated operation, economic value of machines. However, as users get more and more familiar with commanding the equipment the possibilities for more unmediated relationships between user and makerspace will arise, somehow relaxing the need of library control on making process. In the future this could enable different conditions e.g. as to the flexibility in space and the spreading of equipped performing places in different library locations.

Self-directed use of VR at 's-Gravenzande. *Kuijper.*

17. Little room for privacy in making has been observed in all the visited settings. Indeed the experience is mostly done in group and/or under supervision. Yet, is this as well a form of ethical control on the makers production? Would one user be allowed to make e.g. pornographic material? Or music texts holding unethical content? There is an evident tension

in the interpretation of the role of libraries for guaranteeing the independence of the user that generates own self-directed content, against the degree of privacy offered by the making experiences which do not equal the other possibilities (reading, writing, gaming). Is there a role for spatial configurations to act as a mediator for these instances? Should the making library offer a larger variety of conditions between private and public? Will the maker's privacy become one hot ethical issue in the next future?

The makerspace as potential business-case in library context

18. Some could believe that makerspaces are a new business-case for libraries[20] in the entrepreneurial sector and an alternative source of income – at least for matching the makerspace expenses.[21] To approach (local) entrepreneurs is sometimes mentioned by library makerspaces as possible option (KB 2018), but it is not really pursued as the inquirers have not found cases in which this option was actively attempted.[22] The distance between the potentials/scope of the library enterprise and those of the real business is still very big: machinery range, types and variety of materials, staff availability and expertise, volumes of production and alike are concrete factors constraining the possibilities. The library makerspace could have the function to unlock bottom-up creativity and test some basic intuitions, which is the mechanism at the base of creative industry, but at the

Eindhoven library makerspace at Microlab. *Caso.*

20 With reference to the financial business-case, not to the socio-cultural one which is evident.

21 About the financial sustainability of FabLabs, see Boeck & Troxler (2011). Boer (2015) describes the business-case of the Frysklab as offering of services and programs to parent institutions.

22 Eindhoven's library makerspace experiment is very interesting as this one is located in the Microlab, a dedicated creative industry building where craftsmen/design firms are operating. It will be interesting to hear about the final evaluation.

moment can hardly become a competitive entrepreneurial makerspace workshop[23] – at least until a deeper maker economy arises that can structurally sustain makers throughout (Holman 2015). If the library makerspace seriously aims to engage entrepreneurial making, then a much more ambitious setting should be created, with specific spatial and programmatic characteristics and an adequate budget / staffing.

The main lessons learned from observing makerspaces in Dutch library context

19. Inspiring makerspace spatial practices observed by the inquirers:

- Tilburg for the embedding in the library and for the potential to fertilize the relationships with different types of visitors and library services;
- Amsterdam Waterlandplein for the spatial autonomy (own entrance, toilet, pantry) and for the widespread making options;
- Amsterdam Slotermeer for the urban visibility;
- Apeldoorn for its organization into different spaces (VRLab, workshop area, making area);
- Leeuwarden for the specific interior design and use of educational Lego (sponsored through a local alliance);
- Breda for the internal visibility, presence and own identity;
- Tilburg, Veenendaal, Apeldoorn for the flexible active ancillary spaces for peak moments or activities where focus or silence is needed;

23 However, the entrepreneurial perspectives of making in library context are nuanced when including ability of self-activation and/or artistic creativity like writing, music, act performing. This could more easily find a platform in the library as these services make increasingly often part of the library offer, especially in the case of the mentioned cultural clusters.

- Middelburg for the potentials of the close relationship with the ‘writing lab’ (creation);
- Makerspaces with their own physical storage space;
- Amsterdam’s branding *Maakplaats 021* for common features across branches (visual identity, furniture, ambition) and for the engagement in (less favoured) areas.

20. Main spatial issues observed by the inquirers:

- Steenwijk is isolated because its position in the basement and the difficult routing;
- Steenwijk for the limitations due to the safety measurements of the bank (located in the same building than the library) whose bank caveau in the basement borders the makerspace;
- ’s-Gravenzande for the somehow odd relations between makerspace (children, noise) and the reading table (silence, elderly people, community service);
- Tilburg for the potential noise and interference with other library functions: risk of ‘taking over’ the library, often confused with information desk;
- Eindhoven suffers from the physical detachment from library, potentials of relationships with creative industry are not yet made true;
- All makerspaces but few: uniformity and genericity of interior design (visual identity, furniture);
- Scarcity of trained staff/volunteers in relation to demand;
- The overwhelming learning-oriented approach to digital making, with the related design choices, which risks to overshadow the pleasure factor.

3. Five challenges for a (next) future agenda

The future is unpredictable. Probably, over ten years there will be no longer a discussion about makerspaces in library context because making will be a common feature in public libraries. Or maybe there will be no libraries any longer, not in the sense we understand them now, but making landscapes for self-directed (cultural) development. Perhaps making will just disappear from libraries and rely on own facilities. A Dutch investigation on the Library of the Future (SIOB 2014) foresees a major role for public libraries in the development of a knowledge society devoted to a knowledge economy, and the dissemination of the necessary skills. This library will act as a connector at many levels: among people and information; among people each other; with and within the community; among different types of source of information (SIOB 2014). The makerspace development fits these predictions, but poses as well new questions about the future public libraries 3.0 or 4.0 as they will still engage in similar discussions about own 'updating' as nowadays. How will they continue to grant access to relevant knowledge and tools to all, regardless of budget, gender, age, religion? how will they still realize local community embedment? and which forms will this all take in the future?

Inspired by the empirical observations, the discussed potentialities and the critical aspects, the following five challenges are plausible work-hypotheses regarding the spatial aspects of the future of makerspaces in the context of the public library. These hypotheses have been selected and developed in an internal speculative brainstorm by following an abductive type of reasoning. The challenges overlap and are complementary with each other, forming in this way a spatial agenda for discussing the future of library

makerspaces. These challenges are activist in nature in order to stimulate discussion on makerspaces in the Dutch public libraries. They concern: the integration of the makerspace in library and community; the identity and specificity of the makerspace; the makerspace as a place for leisure activities; the makerspace networking as a cultural infrastructure; the making culture in development.

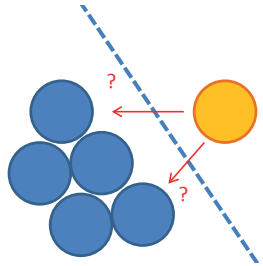
Make It Belong!

This first challenge addresses the makerspace in the context of the relationships among the different offers of the contemporary public library program, and their extension to the public realm. It refers to the crucial topic of the integration of the growing programmatic diversity of the library into a narrative able to generate added (cultural) value, and able to share this renewed value with the urban public realm.

These relationships have been found to be weak during the inquiry, probably because the makerspace is a recent addition to the public library program, whose development is still in its infancy. Yet the issue of the introduction of 'making' as tool for self-directed (cultural) development in the library institute goes hand in hand with the issue of the servicing plurality of the contemporary library and of the potential benefits this plurality can enable. The contemporary library offers room for meeting, for learning, for inspiration, for performing (Jochumsen et al. 2012); the present Dutch Library's Bill (WSOB 2014; Lankhorst 2015) defines five core functions[24] for contemporary public libraries in the Netherlands. In theory

24 1: The library as warehouse of knowledge and information; 2: The library as a centre for development and education; 3: The library as a source of inspiration for reading and literature; 4: The library as an encyclopaedia of art and culture; 5: The library as a podium for meeting and debate.

all these areas overlap and collaborate with each other, but what concrete forms do these overlapping assume, and in how far are they able to generate new (hybrid) content?[25] In which new ways does the library interact with the urban realm, and what opportunities does the makerspace offer at this regard?



A stronger integration between the makerspace and the overal library servicing could result in the improvement of cultural cross-fertilization.

The hypothesis here is that these relationships should have to be directed in order to facilitate added value through cross-fertilization, in this including the extension of the library towards the city for a better involvement of the public realm. The assumption is that the combination (hybridization) of (cultural) content is the enriching potential enabled by the increased variety in (cultural) offer. Accordingly, the spatial assignment for the makerspace will be to visualize and clarify these opportunities for all. As the spatial organization in libraries is presently still centred around the autonomy of the services (the different functional islands) and not yet enough around the users (the serendipity potential, the cross-fertilization, the borders), which elements can work as 'glue', offering the connective structure across the multiplicity of contemporary libraries? What position can the makerspace take in this? How can the internal library relationships be shaped and materialized

25 Hybrid as by Lessig (2008), the creative ability to remix different cultural products in a new expression.

in an inspirational way serving the library in general and specifically the makerspace? What types of overlapping between public library and urban realm can be realized, in which the makerspace can participate? The spatial issue at stance is the physical integration / anchoring of the makerspace into the public library offer and the engaging of the urban territory through the renewed 'making' meaning of the library: cross-fertilization, visibility, urban engagement.

Make It Your Place!

The second challenge refers to the relationships among local specificity and the design of the makerspace. In doing this it addresses the issue of the identity of the library as part of a territorial setting with an own specificity made of local programmatic and physical characters.

Although with few exceptions, the makerspaces observed during inquiry showed neutral spatial characters along with a design that is generic in form and in function and that hardly makes visible local specificities or materializes a particular (community) identity. This challenge is strongly connected to the theme of the changing perception of the public library by the community, in which the library is increasingly supposed to be representative and responsive to local conditions: a relevant public place embedded of local meaning that pro-actively proposes itself as a 'platform' (Lankes 2012) for 'connections'. Against this assumption, the design of makerspaces in libraries is too often generic as it is modelled around the genericity of the equipment: several desks, a set of 3D printers, other tools like (laser) cutters, enough power sockets. Also, the contemporary library strives

for becoming a ‘third place’ (Oldenburg 1989; Vos 2017), a social reference and a familiar ‘safe’ place in the community. Which makerspace actually fit this description? Many public libraries are situated in historical buildings, monuments embedding the local culture, and many Dutch cities are dealing with the legacy of their former industrial vocations; yet when it comes to the makerspace this one shows a neutral, identity-devoid setting. Willingham (2018) suggests that the first task of a newly established library makerspace should be to ‘make’ the furnishing – as a sign of bottom-up appropriation by users. However, more possibilities for realizing specific makerspaces can be imagined.

In spite of the current neutrality and uniformity, a makerspace could assume many forms in order to reflect / distinguish the identity of the community.

The hypothesis is that the makerspace should express local conditions and show an unique stronger individuality, not only in terms of programs but as well physically, by being recognizable environments that are well-embedded in the context. The assumption is that specificity in space is a tool for the generation of value, in this way opposing to the present diffused genericity of spatial standardization, and it is a mean to build community identity. Accordingly the spatial assignment is to discover and materialize the genius loci in the design and lay-out of the makerspace as a specific place in a specific library building conceived for a specific community with specific ambitions. This assignment is twofold: on the one hand, it concerns the identity in design of the makerspace as such, yet able to support the chosen functional program; on the other hand, it refers as well to the potential

of the makerspace for becoming part of the local 'social' public realm, an attractor for people's gathering regardless of participation in making activities. What design could emphasize the local specificity? How to create identity through makerspace architecture? What synergies with local cultural activities can be facilitated by the makerspace design? How to create a place that is representative of the users and able to generate local identity and belonging? Can the makerspace become the 'third place' of the future, the 'community kitchen' overcoming the 'community sitting-room' concept? The spatial issue connected to this challenge is the creation of identity and 'placeness' in library makerspace and in its urban embedment: unicity, representativeness, cultural anchoring.

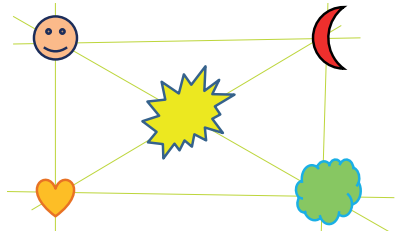
Make It Fun!

This third challenge approaches the interpretation of the makerspace as a learning environment: a laboratory for the development of 21st century skills by users, particularly in the form of 'digital' making. It concerns the issue of the relationships between performing space and learning space[26] in the public library, in relation to the desired identity.

The inquired makerspaces in libraries mainly show a learning finality, also as business-case by serving allied parties like (primary) schools. They offer courses, instructions, workshops and trainings for a variety of target groups, especially children, making a great job of diffusing digital literacy and familiarity with new technologies. Yet, the rationale for visiting a library is not always functional to (self-directed) learning, and this also applies to the makerspace. The leisure factor still has a fundamental importance in profiling library

26 Often quoted in this work: Jochumsen (et al. 2012). In this case the distinction between performing space and learning space is taken as a discriminant for speculating on the future, in the light of the inquired case-studies.

services across patrons and users, contributing to an attractive, playful and relaxing environment. Furthermore, the steady growth of the 'leisure' sector among urban economies is evident, and it is rapidly transforming into a life-embedding condition (Metz et al. 2002; Maas & Sverdlov 2016). Will future cities be populated by a new, more radical type of *Homo Ludens* (Huizinga 1949)? The constructionist learning-by-doing approach (Papert & Harel 1991) in makerspace didactics should as well cherish the performative, leisure side of making as distinct from the pure 'learning' activities. Programs and workshops offered by library makerspaces use 'fun' as a key to techniques and equipment, by brewing e.g. a key-hanger, a baby-doll, or an elementary computer program. Nevertheless, where does the border between (leisure oriented) performing and learning lay?[27] Could leisure in performing be more hard-core: 'radical fun'? Could a stronger distinction between performing and learning contribute to expand audience in library makerspaces?



A leisure approach to library makerspace that complement the educational finalities could reveal the full potential of making culture for the public library.

The hypothesis at this regard is that the present overwhelming focus on learning in library makerspaces overshadows the amusement factor, transforming makerspaces in school extensions by this dealing with users as students – thus generating a somehow

27 Evidently many overlapping exists between performing and learning, also in the light of the quoted constructionist approach to education, yet it would be wrong to eliminate this distinction.

associated ‘compulsory’ image.[28] The assumption is that the development of serious leisure content by library makerspaces is a positive, efficient drive towards the engagement of a wider public from the community, for which a sharper distinction between learning and performing would be recommended for avoiding to flatten the makerspace offer to only match the overlap between the two spaces. Accordingly, the spatial assignment is to conceive ambitious spaces connected to the makerspace that are lay-outed as arenas for entertainment, gaming and amusement, that are landscapes of performative fun. What spatial configurations could help leisure performative activities in public library context? What spatial characters emphasize serious ‘entertainment’ factor in makerspaces? How can the leisure content be made visible to library users? Is a ‘fun landscape’ the possible spatial connector in the future public library? How does the design of the future library connect and integrate different types of ‘fun’? The spatial issue related to this challenge is to design playful, engaging makerspaces like part of Cedric Price’s ‘fun palaces’ (a.o. Mathews 2005) in which the leisure factor is an inviting drive for participation: fun landscape, gaming arena’s, engagement.

Make It an Infrastructure!

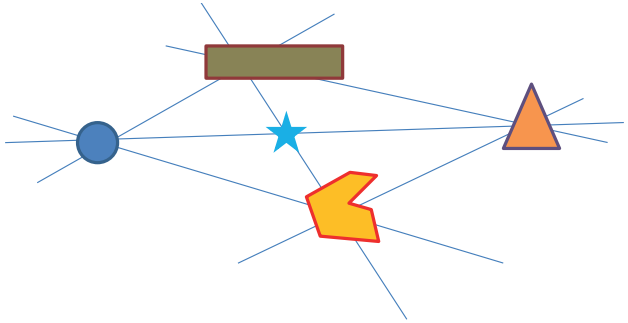
This challenge elaborates upon the potential of connectivity among comparable experiences diffused on the wider territory, for the creation of an integrated responsive and collaborative environment. It addresses the issue of the relationships between physical building and virtual space in library makerspaces, in the form of the materialization in place of the digital communication.

28 Obviously the very relevant learning content of performative makerspaces is not under discussion. The hypothesis is that makerspaces should be as well able to generate serious leisure content.

Notwithstanding that the nature of the inquired makerspaces is mostly based on advanced (information and communication) technologies, the inquiry has shown that little is felt in physical library makerspaces of this ever-present virtual world and of the related opportunities. Makerspaces often participate in larger (remote) networks, but the translation of this extended experience in space and territory is limited: apparently they do not form together a single system, an infrastructure, but operate singularly apart. The metaphor of infrastructure applied to library and makerspace have been used earlier (Matterns 2014; Hollman 2015) in order to conceptualize the meaning of the libraries for the communities and the territories, but especially to point out their potential nature of being interconnected, of forming a system. In particular, when it runs on digital platforms or it adopts models based on advanced (open source) technologies (like the FabLab), the networking and the associated co-working/co-creation is inherently part of the making experience – both as it takes place remotely (being part of a nation-wide/global system to share with) or as it happens locally, creating opportunities for sharing and collaborations within the surrounding community. Networking belongs to makerspaces, for which an infrastructural approach to the system can produce added value. How does the extended networked makerspace manifest itself in library environment? Which conditions are connected to the creation of an infrastructural system of makerspaces?

The hypothesis is that the networking among experiences that happens apart in space, being it a local, national or international context, valuably extends the makerspace quality by linking it to a constellation of opportunities through virtual connections. The assumption is that library makerspaces are the gates, the connecting windows that can render virtual communication as solid and concrete as the physical exchange by

materializing an interconnected system made of peoples and opportunities. For this, they deserve to be designed as infrastructural centres. The related spatial assignment is to render the opportunities visible and inspiring for all users, breaking through the barriers of physical proximity.



The creation of a civic cultural infrastructure of library makerspaces remotely linked in a networking structure would enhance ubiquitous co-learning, co-creation, sharing.

What spatial organization is able to accommodate the infrastructural challenge? How can an infrastructural approach to makerspaces across territories be made visible in public libraries? What spatial solutions facilitate (remote) co-actions? How can the design of the physical place inspire all users to explore and gain advantage from the virtual spaces and their connectivity? Are there new forms of collective actions across the time-space boundaries to be materialized in place? And what will bring the future integration of virtual networking and physical space, when extensions of the physical reality happens in forms like virtual and/or augmented reality? The spatial issues of this challenge addresses in particular the creation of connecting gates between the physical space and the virtual space of communication and co-creation: connecting windows, remote communication, integration of physical and virtual space.

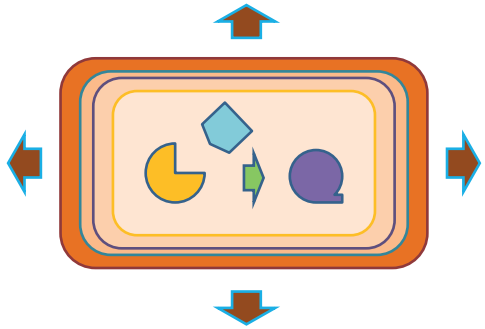
Make It a Culture!

This challenge deals with the changing modalities of cultural behaviour in libraries and with the changing approach to library services. It regards the issue of a growing pro-active attitude in interacting with the society by cultural audiences and library visitors.

Observed libraries already initiated this cultural change by assuming more and more an active behaviour in relation to own services and bringing products in cultural markets. Their approach is no longer just limited to managing the collections. In turn, this growing pro-active attitude by libraries and library staffs increasingly meets the new pro-active attitude by library visitors. The development of makers and makerspaces in present society and the increase of their presence in public libraries can be placed in this light,[29] as part of the change in the way in which culture is produced, consumed and exchanged (see Sacco 2011). Future foresights (EU 2015) prefigure a society in which autonomy, life-long learning and an entrepreneurial attitude will become ever more fundamental values for participating in society. This is not only an issue of digital literacy, but of acquiring the skills and the attitude in order to act as a 'prosumer' (Toffler 1980; Sacco 2011; Ritzer 2012), an evolving person with a problem-solving and critical approach towards the evenly rapidly changing social development. Accordingly, makerspaces in libraries should not be simply considered as another additional service but as the cradle of a new culture which eventually will interest the entire library institute. It is a paradigmatic change: the new culture will require new types of engagement between library, makerspaces and community, like marketplaces / stages for facilitating the dissemination of making products of innovation

29 See at this concern the first chapter of this book, p.15-18.

or artistic expression.[30] Indeed, the next future will confront societies with the continuing advancements of technology and with the rise of new superior technologies people will need to be familiar with: DNA and bioengineering, personal robotics, food printing, symbiosis, dynamic materials. How to prepare the library and its makerspace to meet the future challenges? How can the library makerspace help in developing a learning, pro-active making culture in the community, and how can it keep supporting the future requirements?



The arising paradigmatic shift towards a Culture 3.0 phase characterized by prosumption and 'liquid' societies also requires a paradigmatic change of the public library in order to prepare for a future of new, far-reaching technologies and related literacy.

The hypothesis here is that making will represent the next library identity in future, by which the relationships between library services and visitors will be influenced by a 'prosumer' attitude. The assumption is that the development of 21st century skills especially lays in the creation of a renewed culture of active participation, doing and enterprising – which render the library resilient and able to face the technological challenges of the future. The connected spatial assignment for makerspaces in library context will be to design spatial frames of action which can evolve alongside the evolving society and

30 This would be useful not just in order to create and support a dedicated making economy, but to create conditions for a better human capital building, as observed by Lessig (2008).

that structurally support the required technology literacy in time. Accordingly, flexibility and changeability will acquire even more importance in the future makerspace design, but this will extend further to involve all internal and external relationships of the library. This assignment has therefore two sides: on the one hand, the internal organogram of the library should be reconsidered in the light of the changing approach to culture; on the other hand, the library makerspace should concretely involve the community in this changing approach by supporting the products and modality of making culture throughout. What spatial characters will such a library need in the future in order to express its cultural role? Which forms will underline the new cultural position of the library, both internally and in relation to the urban setting? How will the building regulate the relationships with community and urban space, when making is the leading value? Will there still be a distinction between the makerspace and the other services? How will the design of the public library change, when making becomes the main *modus operandi*? The spatial issue at stance in this challenge refers to the creation of a making culture as shared common ground to accommodate future changes and generate community binding: flexibility, changeability, marketplace, stage, construction.

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