

CYBRID AESTHETICS:

Exploring the expressive potential of paper as a material for spatial application to define the new cybrid archive character.

Dissertation by Gerda Scheepers

Submitted in partial fulfilment of the requirements for the degree Master of Interior Architecture (Professional) to the faculty of Engineering, Built Environment and Information Technology.
Department of Architecture
University of Pretoria

November 2016

Study leader: Anika Grobler
Co-Study leader: Prof Raymund Königk
Studio Master: Prof Barbara Jekot

PROJECT SUMMARY

Dissertation title: *Cybrid* Aesthetics: Exploring the expressive potential of paper as a material for spatial application to define the new *cybrid* archive character.

Submitted by: Gerda Scheepers

Study Leader: Anika Grobler

Co Study Leader: Prof. Raymund Königk

Studio Master: Prof. Barbara Jekot

Degree: Master of Interior Architecture (Professional)

Department: Department of Architecture

Faculty: Faculty of Engineering, Built Environment and Information Technology

University: University of Pretoria

Proposed Programme: Architectural Archive

Site: Eastern wing of the Building Science building a.k.a Boukunde

Address: University of Pretoria, corner of Lynnwood Road and Roper Street, Hatfield, Pretoria, South Africa

Research Field: Heritage and Cultural Landscapes

KEYWORDS

Archive

Paper

Research through making

Aesthetics

Cybrid

Artefact

Dematerialization

Digital realm

Physical realm

ABSTRACT

In recent years the concept of dematerialization has had an effect on design professions that rely on materiality for its manifestation. This process has diminished the unique characteristics of design, but through the investigation of making as integral part of the design process, the creative identity and status of design can be strengthened again. This dissertation proposes a parallel process which integrates the act of making into the conventional design process, to address both the material and immaterial qualities of a space.

The focus of the study is to investigate and determine a new spatial language as the digital and physical realms are merging together to create the concept of a *cybrid* space. The Boukunde archive holds opportunity for this investigation to express the new character of a *cybrid* space. Characteristics of both the paper archive and a digital archive are extracted to inform and define the re-representation of the archive in its contemporary context.

Paper at present does not yet have a clearly defined spatial language in the built environment therefore through the exploration of this unconventional material in an innovative way, creates the opportunity for a new interaction and experience. Paper becomes a symbol of the old paper archive that has been re-interpreted in the *cybrid* archive where this new space embodies qualities of both the physical realm and the digital realm that are experienced in novel ways. The paper installation becomes the visual link in the space which captures the essence of the architectural drawing archive.

UITTREKSEL

In onlangse jare het die konsep van dematerialisering 'n invloed op die ontwerp beroepe gehad. Hierdie proses het die unieke eienskappe van ontwerp onderdruk, maar deur die ondersoek van die Research Through Making metodiek as integrale deel van die ontwerpproses, kan die kreatiewe identiteit en status van ontwerp weer versterk word.

Die doel van die verhandeling is om weg te beweeg van konvensionele ontwerp prosesse, deur die proses van maak te versterk sodat die materiële en nie-materiële eienskappe meer geïntegreer kan word in die ruimtelike uitkoms.

Die fokus van die studie is om ondersoek in te stel en te bepaal wat die nuwe ruimtelike taal is wanneer die digitale en fisiese ruimtes geïntegreer word in een nuwe ruimte, as deel van die *cybrid* konsep. Die Boukunde argief hou geleentheid vir hierdie ondersoek om die nuwe karakter van 'n *cybrid* ruimte te ondersoek en uit te beeld.

Papier tans het nie 'n duidelike ruimtelike taal in die bou omgewing nie en dus deur die verkenning van hierdie onkonvensionele materiaal op 'n innoverende manier, skep dit geleentheid vir 'n nuwe ruimtelike toepassing en ervaring. Papier word 'n simbool van die ou papier argief asook die estetiese en funksionele voorstelling van die *cybrid* argief. Die nuwe ruimte vergestalt eienskappe van beide die fisiese and digitale ryke en die papier installasie word die visuele verbinding in die ruimte wat die essensie vna die argitektoniese tekening argief vas vang.

JT Pienaar

Thank you for all your love, patience and support through this year. Thank you for sharing my excitement in the good times, and giving words of motivation in the bad.

Jy is my rots

...en die beste model bouer.

Eloise Thompson

Thank you for being my *kla maatjie* through this year, I would not have been able to do this without you.



In accordance with Regulation 4(e) of the General Regulations (G.57) for dissertation and theses, I declare that this dissertation, which I hereby submit for the degree Master of Interior Architecture (Professional) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution. I further state that no part of my dissertation has already been, or is currently being, submitted for any such degree, diploma or other qualification.

I further declare that this thesis is substantially my own work. Where reference is made to the works of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references.

Gerda Scheepers



TABLE OF CONTENTS

<i>Cybrid</i> Aesthetics:	i
Project Summary	ii
Keywords	ii
Abstract	iii
Uittreksel	iii

CHAPTER 1: INTRODUCTION 1

1.1	
Dematerialization	2
1.2	
Effects of dematerialization	3
1.2.1	
Fractured space	3
1.2.2	
Need for interaction	4
1.2.3	
Design process	4
1.3	
Research Through Making	5
1.4	
Context	5
1.5	
Paper	5
1.6	
Research questions	6
1.7	
Objectives	6
1.8	
Delimitations	6
1.8	
Defining terms	6
1.9	
Chapter overview	7

CHAPTER 2: METHODOLOGY

2.1	
Dematerialization in design	10
2.2	
Research Through Making	11
2.2.1	
Fabrikaat	11
2.3	
Precedents	12
2.3.1	
Reflections	14
2.3.2	
Synthesised design process	14
2.5	
Conclusion	17



CHAPTER 3: CONTEXT	19
3.1	
Archive	20
3.1.1	
Importance of archives	20
3.2.1	
Site analysis	22
3.2.2	
Operational purpose	24
3.3	
Convergence - <i>Cybrid</i> space	26
3.3.1	
Comparative analysis	27
3.3.1.1	
Beinecke archive	27
3.3.1.2	
Carlo Scarpa archive	28
3.3.2	
Thick Description	29
3.4	
Precedent study	30
3.4.1	
Kanazawa Umimirai Library	30
3.4.2	
James b. Hunt jr. Library	30
3.4.3	
Unnumbered Sparks	31
3.5	
Guidelines	32
3.6	
Conclusion	33
CHAPTER 4: MAKING	35
4.1	
New Materiality	36
4.2	
Paper	37
4.2.1	
Paper in architecture	37
4.3	
Visual study	38
4.3.1	
Shigeru Ban	38
4.4	
Paper objective	40
4.5	
Material exploration	41
4.5.1	
Folds	42
4.5.2	
Paper Maché	43
4.5.3	
Cut and Layer	44
4.5.4	
Conclusion	45
4.6	
Material Analysis	46



4.7		
Aesthetic	.....	47
4.7.1		
Methods of making	.....	48
4.7.2		
Texture	.....	49
4.7.3		
<i>Cybrid</i> characteristics	.....	50
4.8		
Making image	.....	52
4.8.1		
Model 1	.....	53
4.8.2		
Model 2	.....	54
4.8.3		
Model 3	.....	55
4.8.4		
Model 4	.....	56
4.8.5		
Reflection	.....	57
4.9		
Conclusion	.....	59
CHAPTER 5:TECHNIFICATION		61
5.1		
Intervention	.....	62
5.2		
Spatial requirements	.....	64
5.2.1		
Space defining element	.....	64
5.2.2		
Light control	.....	64
5.2.3		
Perceived privacy	.....	64
5.3		
Technification: Reflections	.....	66
5.3.1		
Suspended grid model	.....	66
5.3.2		
Kinetic mechanism	.....	67
5.3.3		
Flexible grid	.....	67
5.3.4		
Glide reflection fold	.....	68
5.3.5		
Multiple V-Fold	.....	69
5.4		
Spatial intervention	.....	70
5.5		
Suspended paper installation	.....	72
5.6		
Grid and kinetic mechanism	.....	74
5.6.1		
Management system	.....	74
5.7		
Grid installation	.....	76
5.8		
Material selection	.....	78
5.8.1		
Durability fold test	.....	78
5.8.2		
Light quality	.....	78
5.8.3		
Conclusion	.....	79
5.8.4		
Tyvek Paper	.....	79



5.9		
Finishing and maintenance	.....	80
5.9.1		
Fire retardant finish	.....	80
5.10		
Fabrication and assembly	.....	81
5.11		
Archive	.....	86
5.11.1		
Archive requirements	.....	86
5.12		
Digital Screens	.....	88
5.13		
Conclusion	.....	92
CHAPTER 6: FINAL REFLECTIONS		95
6.1		
Personal Reflections	.....	96
6.2		
Contributions	.....	97
6.3		
Recommendations	.....	97
6.4		
Conclusion	.....	98
LIST OF REFERENCES		101
7.1		
List of references	.....	102

LIST OF FIGURES

INTRODUCTION

Figure 1.1 Effects of Dematerialization (Author. 2016)	2
------------------------------------------------------------------	---

METHODOLOGY

Figure 2.2.1 Material Experimentation (Dezeen. 2012)	11
Figure 2.2.2 Fabrikaat Material Exploration (Dezeen. 2012)	11
Figure 2.2.3 Texture Tectonics Making (Taubman College. 2016)	11
Figure 2.2.4 Texture Tectonics (Taubman College. 2016)	11
Figure 2.2.5 Hybrid Research Strategy (Wherry. 2015:8)	11
Figure 2.3.1 Grace under pressure (O'Neil. 2009)	13
Figure 2.3.2 Knowing through making (Wherry. 2015)	13
Figure 2.3.3 Grace under pressure interpreted process (Author. 2016)	14
Figure 2.3.4 Knowing Through Making design interpreted process (Author. 2016)	15
Figure 2.3.5 Proposed design process (Author. 2016)	15
Figure 2.3.6 Synthesised design process (Author. 2016)	16

CONTEXT

Figure 3.1.2 Boukunde 3rd Floor Plan (Author. 2016)	21
Figure 3.1.3 Photographs of existing archive (Author.2016)	21
Figure 3.1.4 Vision sketch of redefined archive (Author.2016)	21
Figure 3.1.1 Building location on University of Pretoria Main Campus (Author.2016)	21
Figure 3.2.1 Existing reading room	22
Figure 3.2.2 Existing Honours studio	22
Figure 3.2.3 Double volume crit space	22
Figure 3.2.4 Existing floor plan and function	23
Figure 3.2.6 Section(not to scale): Natural light entering the space	23
Figure 3.2.5 Photo board of existing materiality and space.	23
Figure 3.2.8 Conversation and debate (Author. 2016)	25
Figure 3.2.9 Research and learning (Author. 2016)	25
Figure 3.2.7 Operational purpose (Author. 2016)	25
Figure 3.2.10 Presentation space (Author. 2016)	25
Figure 3.3.1 Beinecke Archive (Perez. 2010)	27
Figure 3.3.2 Beinecke archive office (Yale University Library. 2013).	27
Figure 3.3.3 Reading room (Yale University Library. 2013).	27
Figure 3.3.5 Plan and Sections of Beinecke Archive (Stoller. 2010)	27
Figure 3.3.4 Book tower (Perez. 2010)	27
Figure 3.3.6 Screen view of Carlo Scarpa online archive (Author.2016)	28
Figure 3.3.7 Convergence (Author.2016)	28
Figure 3.4.1 Kanazawa Library (Archdaily. 2011).	30

Figure 3.4.2 James B Hunt Jr (Dezeen. 2013) . . . . .	.30
Figure 3.4.3 Unnumbered Sparks (Unnumbered Sparks.2016). . . . .	.31

MAKING

Figure 4.3.1 Japanese Pavilion (Anderson. 2014). . . . .	.38
Figure 4.3.2 Close up of Pavilion (Designboom. 2013) . . . . .	.38
Figure 4.3.3 Pavilion Detail (Ricther. n/a). . . . .	.38
Figure 4.3.4 Detail joinery (Ricther. n/a) . . . . .	.38
Figure 4.3.5 JR Onogawa station (Hirai. 2015) . . . . .	.38
Figure 4.3.6 Hermes pavilion (Designboom. 2011) . . . . .	.38
Figure 4.3.7 Cardboard cathedral (Anderson. 2014) . . . . .	.38
Figure 4.3.8 Paper Tower (Designboom.2009) . . . . .	.38
Figure 4.3.9 Collage of paper products and interior application (Various Sources) . . . . .	.39
Figure 4.4.1 Convergence of paper characteristics (Author. 2016) . . . . .	.40
Figure 4.5.1 Techniques for making with paper. . . . .	.41
Figure 4.5.3 Sketch development: adaptable plane (Author. 2016) . . . . .	.42
Figure 4.5.2 Folds: Material Exploration . . . . .	.42
Figure 4.5.4 Associations of folding (Author. 2016) . . . . .	.42
Figure 4.5.5 Paper Maché: Material Exploration . . . . .	.43
Figure 4.5.6 Associations of paper maché (Author. 2016) . . . . .	.43
Figure 4.5.7 Sketch development: Potential application (Author. 2016). . . . .	.43
Figure 4.5.9 Sketch development: layered paper planes (Author. 2016). . . . .	.44
Figure 4.5.8 Layered: Material Exploration (Author. 2016) . . . . .	.44
Figure 4.5.10 Associations of cutting and layering (Author. 2016). . . . .	.44
Figure 4.5.11 Qualities of paper(Author. 2016) . . . . .	.45
Figure 4.6.1 Material Associations (Author. 2016) . . . . .	.46
Figure 4.6.2 Material palette (Author. 2016) . . . . .	.46
Figure 4.7.1 Methods of Making (Author. 2016). . . . .	.48
Figure 4.7.2 Spatial Character (Author. 2016) . . . . .	.52
Figure 4.8.3 Spatial development sketch: Reflection to model 1 (Author. 2016) . . . . .	.54
Figure 4.8.1 Collection of photographs: Test 25 (Author. 2016). . . . .	.54
Figure 4.8.2 Sectional Model 1 (Author. 2016) . . . . .	.54
Figure 4.8.4 Collection of photographs: Test 28 (Author. 2016). . . . .	.55
Figure 4.8.6 Spatial development sketch: Reflection to model 2 (Author. 2016) . . . . .	.55
Figure 4.8.5 Sectional Model 2 (Author. 2016) . . . . .	.55
Figure 4.8.7 Sectional Model 3 (Author. 2016) . . . . .	.56
Figure 4.8.8 Collection of photographs: Test 26 (Author. 2016). . . . .	.56
Figure 4.8.9 Collection of photographs: Test 23 and 26 (Author. 2016). . . . .	.57
Figure 4.8.11 Spatial development sketch: Reflection to model 4(Author. 2016) . . . . .	.57
Figure 4.8.10 Sectional Model 4 (Author. 2016). . . . .	.57
Figure 4.8.12 Integration of codes and <i>cybrid</i> characteristics (Author. 2016). . . . .	.58

TECHNIFICATION

Figure 5.1.1 Levels of intervention (Author. 2016) . . . . .	.62
Figure 5.1.2 Demolition section (Author. 2016) . . . . .	.63
Figure 5.1.3 Demolition plan (Author. 2016) . . . . .	.63
Figure 5.2.1 Flat ceiling plane (Author. 2016) . . . . .	.64
Figure 5.2.2 Convex ceiling plane (Author. 2016) . . . . .	.64
Figure 5.2.3 Concave ceiling plane (Author. 2016) . . . . .	.64
Figure 5.2.5 Scenario 2: Conversation and debate (Author. 2016) . . . . .	.65
Figure 5.2.4 Scenario 1: Presentation (Author. 2016) . . . . .	.65
Figure 5.3.2 Representation of paper artefact (Author. 2016) . . . . .	.66
Figure 5.3.1 Suspended grid model (Author. 2016) . . . . .	.66
Figure 5.3.3 Movement of suspended artefact (Author. 2016) . . . . .	.66
Figure 5.3.4 Kinetic mechanism with staggered cam and arm (Author. 2016) . . . . .	.67
Figure 5.3.5 Kinetic mechanism (Author. 2016) . . . . .	.67
Figure 5.3.6 Flexible grid (Author. 2016) . . . . .	.67
Figure 5.3.7 Dowel and eye hook (Author. 2016) . . . . .	.67
Figure 5.3.8 Stretched glide reflection fold (Author. 2016) . . . . .	.68
Figure 5.3.9 Glide reflection fold texture (Author. 2016) . . . . .	.68
Figure 5.3.10 Fluidity of glide reflection fold (Author. 2016) . . . . .	.68
Figure 5.3.11 Fluidity of multiple v-fold (Author. 2016) . . . . .	.69
Figure 5.3.12 Collapsed multiple v-fold (Author. 2016) . . . . .	.69
Figure 5.3.13 Multiple v-fold texture (Author. 2016) . . . . .	.69
Figure 5.4.1 Section 1-1 (Author. 2016) . . . . .	.71
Figure 5.5.1 Suspended installation diagram (Author. 2016) . . . . .	.72
Figure 5.5.2 Double volume space (Author. 2016) . . . . .	.73
Figure 5.6.2 Spatial scenarios (Author. 2016) . . . . .	.74
Figure 5.6.1 Plan view of kinetic mechanism (Author. 2016) . . . . .	.74
Figure 5.6.3 Section 3-3 (Author. 2016) . . . . .	.75
Figure 5.6.4 Call out detail: Mechanism (Author. 2016) . . . . .	.75
Figure 5.7.1 View of conversation and debate spaces (Author. 2016) . . . . .	.76
Figure 5.7.3 Kinetic armature layout (Author. 2016) . . . . .	.77
Figure 5.7.2 Static armature layout (Author. 2016) . . . . .	.77
Figure 5.7.4 Plan indicating grid for installation (Author. 2016) . . . . .	.78
Figure 5.7.5 Suspended installation (Author. 2016) . . . . .	.78
Figure 5.7.6 Detail: Kinetic armature and adjustable detail (Author. 2016) . . . . .	.79
Figure 5.7.7 3D: Timber dowel grid (Author. 2016) . . . . .	.79
Figure 5.8.1 Fold test (Author. 2016) . . . . .	.80
Figure 5.8.2 White paper 80g/m2 light quality (Author. 2016) . . . . .	.81
Figure 5.8.3 Tracing paper light quality (Author. 2016) . . . . .	.81
Figure 5.8.6 Dupont Tyvek (Author. 2016) . . . . .	.81
Figure 5.8.4 Kraft paper light quality (Author. 2016) . . . . .	.81
Figure 5.8.5 Dupont Tyvek light quality (Author. 2016) . . . . .	.81
Figure 5.10.1 Fold instructions (Author. 2016) . . . . .	.83
Figure 5.10.2 Fold and perforation pattern (Author. 2016) . . . . .	.84
Figure 5.10.3 Folded sheet assembly (Author. 2016) . . . . .	.85

Figure 5.10.4 Layout plan (Author. 2016) . . . . .	.86
Figure 5.10.5 Furniture legend (Author. 2016) . . . . .	.87
Figure 5.10.6 Section 2-2 (Not to scale) (Author. 2016) . . . . .	.87
Figure 5.10.7 Floor finishes plan (Author. 2016) . . . . .	.88
Figure 5.10.8 Acoustic ceiling (Author. 2016) . . . . .	.89
Figure 5.11.2 View of archive storage space (Author. 2016) . . . . .	.91
Figure 5.11.1 3D: Archive (Author. 2016) . . . . .	.91
Figure 5.11.4 Ventilation section diagram (Author. 2016) . . . . .	.92
Figure 5.11.3 Electrical layout (Author. 2016) . . . . .	.92
Figure 5.12.1 View of digital interaction spaces (Author. 2016) . . . . .	.93
Figure 5.12.2 3D: Spatial layout (Author. 2016) . . . . .	.94
Figure 5.12.3 Digital interfaces (Author. 2016) . . . . .	.94
Figure 5.12.4 3D: Shelf details and configuration (Author. 2016) . . . . .	.95

LIST OF TABLES

CHAPTER 1: INTRODUCTION

Table 1.1 Contrasting Character of the digital and physical realm (Author. 2016).3
-------------------------------------------------------------------------------------------	----

CHAPTER 3: CONTEXT

Table 3.3.1 Comparative Analysis (Author.2016)28
----------------------------------------------------------	-----

CHAPTER 4: MAKING

Table 4.6.1 Material Analysis (Author. 2016) . . . . .	.46
Table 4.7.1 <i>Cybrid</i> Characteristics (Author. 2016) . . . . .	.50

CHAPTER 5: TECHNIFICATION

Table 5.7.1 Kinetic grid installation specifications (Author. 2016) . . . . .	.76
Table 5.8.1 Fold test observations (Author. 2016) . . . . .	.78
Table 5.9.1 Technical specifications of Tyvek (Author. 2016) . . . . .	.80



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA



chapter one Introduction

This dissertation investigates the connection between material and immaterial qualities of both the digital and physical realm to establish the re-representation of the architectural paper archive. This dissertation will place emphasis on the act of making in the design process to achieve an imaginative spatial application of a paper artefact as a creative outcome. The paper as medium for exploration becomes the visual link within the spatial aesthetic of the *cybrid* archive.

Chapter one provides a discussion for the process of dematerialization and the effects on the interior environment as background to the study, from where a series of research questions arise. This is followed by the effect of dematerialization on the design process where after research through making as the methodology to the study is introduced and placed into a larger research context. The effects will be placed in context through the elaboration of the paper archive as the programme for this study. Paper as material choice is introduced as is the nature of the research through making method.

1.1 DEMATERIALIZATION

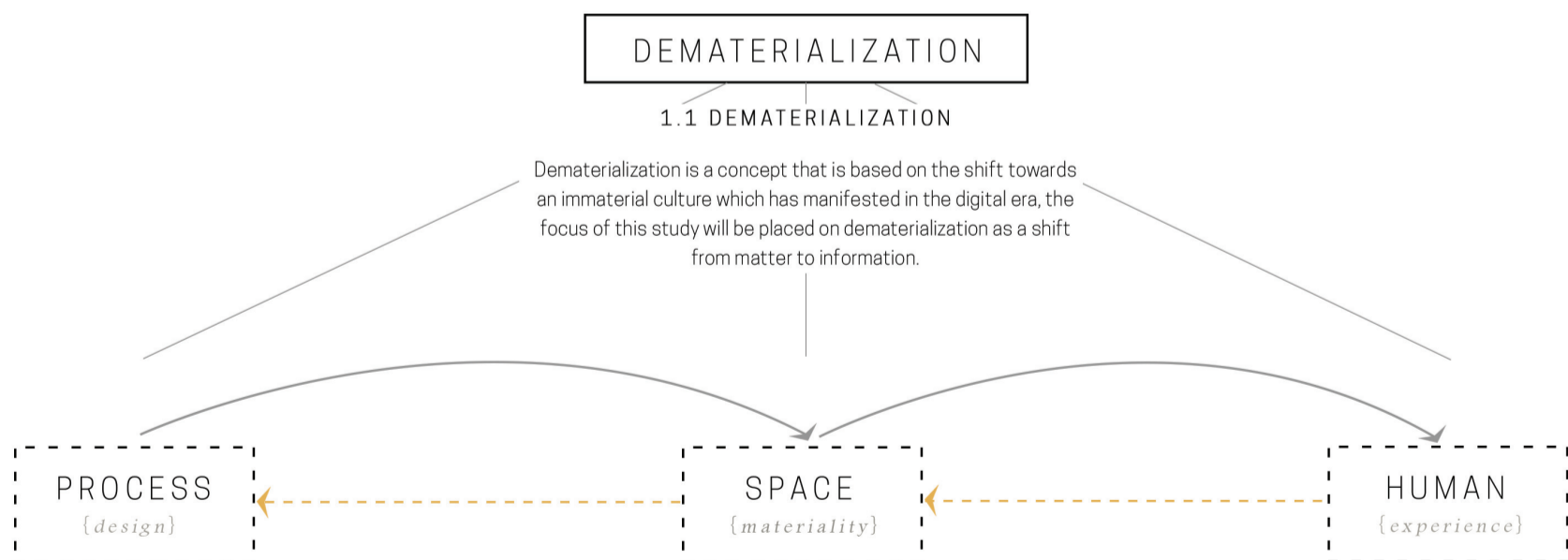
Over the past few years there has been a shift towards an immaterial culture due to the manifestation of a digital era, and because of this society has become reliant on technologies which influence how we socialize, communicate and work. The increasing application of technologies such as the internet and wireless networks in the physical environments is in the process of changing the perception of our physical environments and the materiality thereof. Van Campenhout (2013:3) defines dematerialization as a field of on-going evolutions which include miniaturization of products, reducing material use by recycling and the shift from matter to information.

For the purpose of this study a deeper investigation will be placed on dematerialization as the shift from matter to information. A simple example given by Roscoe (2005:14) is the dematerialization of photographs, which due to the advances of cameras allows photos to be stored digitally. The traditional paperback photographs are being replaced by digital images that are transmitted through networks and stored in files on computers. The artefact no longer requires a physical container or a place and now not only does the traditional paperback photo disappear but also its supporting structures such as the film camera, the processing labs and photo albums. The tangible paper photograph has shifted to a digital screen as part of the digital realm. The result is that support structure, building typologies and interior environments become immaterial. Interior design is defined by the physical boundaries of architecture and Roscoe (2005:4) states that is therefore indebted to material culture for its manifestation. Artefacts will lose its characteristics in the physical environments and adopt those of the digital world as an

effect of this emerging immaterial culture, which becomes a concern to those who deal with the design of physical environments. The digital era creates great limitations on interior design because it requires more abstract and complex manifestations in contemporary interiors. Roscoe (2005:20) explains that it is not to argue that everything material will completely disappear but rather to highlight the effect it will have on the spaces, and although certain things will disappear, it creates massive opportunity for innovative spatial manifestations.

Roscoe (2007:99) raises important questions such as: What does an immaterial culture imply for the properties and characteristics of physical environments? How will the expanding immaterial culture affect the future identity and status of interior spaces? What are we actually losing and what gets left behind in the place of the digitized artefact? Through this process of dematerialization interior design should establish a firm understanding of how this will affect the tangible spatial experience and how spaces will be perceived. The physical fabric that remains should be redefined to adapt to this changing paradigm.

What does an immaterial culture imply for the properties and characteristics of physical environments? How will the expanding immaterial culture affect the future identity and status of interior spaces?



1.2.3 DEMATERIALIZATION OF PROCESS

In recent years the design discipline has become less focused on the production of material things and as more design activities become computer based, it diminishes the significance of material exploration. Resulting in a lack of insight, unimaginative outcomes and a disjointed design process.

1.2.1 FRACTURED SPACE

Roscoe (2005:42) stresses the problem that the digital and physical realm are often considered two separate domains because they are approached and created in isolation to each other and result in disconnected spaces.

1.2.2 NEED FOR INTERACTION

The focus has shifted away from the physical spatial experience toward an immaterial interaction driven by technological devices. This interaction stimulates mostly cognitive skills and dilutes the rich sensory experience of physical spatial interaction.

Figure 1.1 Effects of Dematerialization (Author. 2016)

1.2 EFFECTS OF DEMATERIALIZATION

The effects of dematerialization on interior environments are elaborated in the sections to follow. There are three main aspects that need to be addressed within the context of interior design, which will either diminish the characteristics of our interior environments if left unattended or if seen as a design opportunity, could allow for novel design exploration and solutions. Refer to figure 1.1 for clarity and the relationship between the effects of dematerialization.

1.2.1 FRACTURED SPACE

The differences in characteristics of the digital and physical realm, see figure 1.2.1, is highlighted by Van Campenhout (2013:3). He explains that a physical object is static and cannot suddenly change into something else; the object is dedicated to one task, whereas information is dynamic and can constantly change giving it the sense of temporality. Information can disappear without leaving anything behind whereas a physical object cannot. These differences show that the two realms are disjointed and fractured.

Roscoe (2005:42) stresses the problem that the digital and physical realm are often considered two separate domains because they are approached and created in isolation to each other and result in disconnected spaces. Ishii and Ulmer (1997:1) point out that we live between these two realms, that although they are disconnected they are still parallel because we interact with them simultaneously. We can only interact with the digital through physical but the relationship is disjointed because of their opposite characteristics. The relationship between the two realms becomes a complex area for investigation and how these complexities manifest in interior spaces become an area for intricate design exploration. Refer to Chapter 3 section 3.3 convergence of *cybrid* space for further clarification.

Technologies in the digital era support anytime anywhere activities which alters functional spatial typologies and therefore Roscoe (2005:93) explains that this manifestation of new space requires an intricate investigation into interior design as a study of desire. And she goes on to say that spaces will need to remain flexible

for re-appropriation, but this could have an effect on design aesthetics of spaces as it will become uniform and undefined resulting in a mundane character within spaces. If a space takes on all of the characteristics of cyberspace in order to remain relevant and allowing for constant change, there is a risk of designing spaces that are too flexible and adaptable and not leaving space for any meaningful artefacts.

The presence of the digital realm is altering how space will be used. Where these activities will take place in physical space, is an emerging question that requires a new complex level of investigation from the designer. The change in perception of interior environments should be seen as an opportunity for rethinking and innovative outcomes for the social interaction in a digital era. Chapter 3: Context, offers an in depth elaboration which addresses the re-appropriation of the archive typology to accommodate the characteristics of the *cybrid* space.

The relationship between the two realms becomes a complex area for investigation and how these complexities manifest in interior spaces become an area for intricate design exploration

DIGITAL REALM	PHYSICAL REALM
Intangible	Tangible
Dynamic	Static
Transient	Persistent

Table 1.1 Contrasting Character of the digital and physical realm (Author. 2016)



1.2.2 NEED FOR INTERACTION

Roscoe (2013:42) raises an important question in the following quote which highlights the disappearance of valuable qualities:

What of the tangible, the sensual in the process of increasing immaterial culture? As nostalgic as it may sound, it is imperative that designers embrace a deep investigation of dematerialization to ascertain what is leaving, what is remaining, what is redefined and what is changing in the world. It is imperative for designers to gain a critical analysis on dangers and opportunities offered through dematerialization, and develop a deeper understanding of how it will continue to evolve and expand into the future.

Once an artefact is incorporated into the digital realm, it loses its physical characteristics and adopts those of the digital realm. Because it allows artefacts to break loose from its physical limitations, it becomes dynamic and transient. Although dematerialization creates limitless opportunities it also has many downsides for the human interaction. Van Campenhout (2013:3) highlights that humans are not merely cognitive but action driven beings.

An artefact in the physical realm is tangible and can be touched and understood through its form, texture and materials, all of which gives it meaning. In contrast the information in the digital realm as described by Van Campenhout (2013:2) is intangible and has no shape therefore it is not suitable for human perception. It can only be perceived through mediation of a device and currently these devices appeal mainly to the user's cognitive skills. Anders (2004:135) states that the materiality of spaces is important for creating meaningful spatial conditions where information is interpreted and turned to knowledge. The spaces should offer a context for the appreciation of this information.

The growing immaterial culture raises the question of what is lost in this process. Roscoe (2005:42) highlights that not only does dematerialization translate into the shift from matter to information and the resulting space but she also raises the issues it may have for humans as tactile beings. This places emphasis on the abstract nature of the digital realm and the lack of rich physical interaction which raises the question of how interior environments can be redefined to create opportunity for a richer sensory engagement that integrates the *limitless* characteristics of the digital realm.

1.2.3 DESIGN PROCESS

In recent years the interior design discipline has become less focused on the production of material things and as more design activities become computer based, it diminishes the significance of material exploration. It has resulted in a hands-off design process which could be threatening the creativity of design disciplines. Refer to Chapter 2, section 2.1 Dematerialization in design for further clarification.

1.3 RESEARCH THROUGH MAKING

Due to a growing immaterial culture, the characteristics of the digital have replaced the messy studio based design.

As a counter action to this concept, this dissertation is a response to two preceding projects that dealt with making as a method of research. This study will critically reflect on the projects and contribute to the discipline of interior design by employing the act of making within the design process to achieve more insightful and creative outcomes.

The application of a parallel design process is elaborated in Chapter 2: Methodology, along with a hybrid research strategy developed by Wherry (2015:8) to support the act of making throughout.

1.4 CONTEXT

As a response to the fractured space as an effect of dematerialization, emphasis will be placed on the connection between the digital and physical realm, with the aim to create a seamless integration for the new spatial language. Anders (2004:393) defines a new space where the digital and physical realm is merged into one composition; he denotes this space as the *cybrid*. To place this concept of *cybridity* into the context of this study, the Boukunde archive becomes an ideal specimen for the exploration of the integration of the digital and physical. The *cybrid* concept will inform the character of the re-representation of the Boukunde archive, as it will fuse together the most valuable qualities of both the paper archive and the digital archive.

The site chosen for intervention is located on the Hatfield main campus of the University of Pretoria, in the Building Science building better known as Boukunde which houses the Department of Architecture. The existing architectural archive of Boukunde will be relocated and redefined to create access to valuable information in a contemporary context. The archive will house significant architectural drawing collections which will be stored for proper preservation whilst allowing visual access to actual artefacts. The intention is to expose the archiving process to students as well as creating access to the drawings and artefacts.

1.5 PAPER

In the nature of research through making, paper is chosen to support the act of making throughout the design process.

Paper is a material present in our everyday lives that is perceived as a fragile and unsophisticated product, but for the purpose of this study, paper will be investigated as an expressive medium for interior spatial intervention. The intention is to redefine the spatial language and perception of this very versatile and dynamic material by expressing its unique characteristics through novel application within the architectural *cybrid* archive. The paper will become the visual link between the digital and physical realm through the application of a spatial intervention. Refer to Chapter 4 section 4.2 and 4.3, for further elaboration on paper as a medium for design exploration.

1.6 RESEARCH QUESTIONS

1. What does an immaterial culture imply for the properties and characteristics of physical environments and how will we redefine the things that stay material?
2. What is the new aesthetic character of the *cybrid* space?
3. What are the possibilities and limitations of paper as a material for intervention in interior environments?
4. How can a material driven design process influence the expression of a material in the final spatial outcome?
5. How does the act of making manifest within the interior design discipline?

1.7 OBJECTIVES

1. To explore and express the unique characteristics of paper through a three dimensional spatial intervention.
2. To explore paper as the aesthetic link between the physical and digital realm.
3. To further develop and contribute the proposed process and methods of research through making within the interior design discipline.
4. To define the characteristics and aesthetic language of the *cybrid* space by creating a seamless integration between the digital and physical realm.
5. To create access to significant cultural and historical archived information and determining the re-representation of the archive in a contemporary context.

1.8 DELIMITATIONS

- + This study is driven by material and therefore the conventional method of defining space through spatial layout as initial design phase will not be followed.
- + This study will not investigate paper as a sustainable or recyclable material for building application.
- + This study will not focus on the interface design of the technological device. The design will serve as support to the device.

1.8 DEFINING TERMS

The following is composed from various sources and sources are indicated where necessary. The Oxford Dictionary online was used for the general definition of terms.

DEMATERIALIZE: v. 1. Become free of physical substance. Dematerialization is the process where matter shifts to information and becomes part of the digital realm.

DIGITAL REALM: Van Campenhout (2013:2) defines the digital realm as information and data in the form of bits and bytes that is not perceivable to the human senses, it only manifests through an object, see *device*.

PHYSICAL REALM: The physical environment contains substances like animals, humans, objects which are made up of tangible 'things' but for the purpose of this project the physical environment will refer to all artefacts and interior spaces habitable for humans.

CYBRID: *Cybrid* space is the convergence of spatial domains where the physical and cyberspace is merged into one space. It is a space that is defined not by only one or the other, but by both as explained by Anders (2004:133).

ARCHIVE: n. 1. A collection of historical documents or records providing information about a place, institution, or group of people. 2. The place where historical documents or records are kept.

Archive is not limited to historical documents and includes all artefacts that hold significant cultural and historical value which usually only one of its kind exists.

PAPER: n. 1. Material manufactured in thin sheets from the pulp of wood or other fibrous substances, used for writing, drawing, or printing on, or as wrapping material. 2. A sheet of paper with something written or printed on it.

Paper is a thin flexible sheet of material which can be used as a flat mechanical object or be manipulated into three dimensional artefact.

ARTEFACT: Königk (2015:44) defines artefact as all cultural residue.

DEVICE: n. 1. A thing made or adapted for a particular purpose, especially a piece of mechanical or electronic equipment.

The mediating object through which information of the digital realm manifests in order to make it perceivable to the human senses.



1.9 CHAPTER OVERVIEW

Chapter 1: The chapter introduces the context in which the study will take place. The chapter gives a clear outline of the objectives of the study.

Chapter 2: Methodology of study is placed in a larger research field where this dissertation becomes an iteration on two preceding projects that dealt with the act of making. The aim of this study is to contribute new knowledge to the concept of research through making. A general synthesised design process is elaborated that essentially guides the process followed for the study.

Chapter 3: The chapter is introduced as a response to the background theory given in Chapter 1, where the concept of *cybrid* space will be elaborated. A comparative analysis of a digital and physical archive becomes the core of the investigation and is supported by precedent studies, from which a set of guidelines are established. The Boukunde architectural archive is introduced as the programme for the intervention and the re-representation of the archive is investigated.

Chapter 4: The process of making is introduced along with paper as the material for interior application, where after a visual study and a series of intuitive material explorations follow. The chapter concludes with the documentation, observation and reflection of sectional models as part of the second phase of making. The chapter defines the aesthetic character and requirements for the technification of the space.

Chapter 5: This chapter deals with the design application and technification of the paper artefact as the third phase of the making process, where the detail and fabrication of the paper artefact is investigated, documented and reflected. This chapter includes a series of technical drawings, details and perspectives to express the final spatial outcomes of the design and making process.

Chapter 6: This chapter is a final reflection on the work and research done through the act of making. This chapter includes contributions made by the study as well as recommendations for further study.



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA