

Digital Material Libraries

Overview and application case

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Content

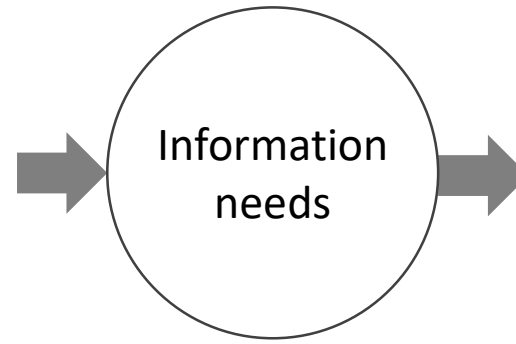
- 1 Introduction – Context
- 2 Why digital material libraries ?
- 3 Brief discussion
- 4 Application case in the Algerian context
- 5 Concluding points

1

Introduction-Context

2

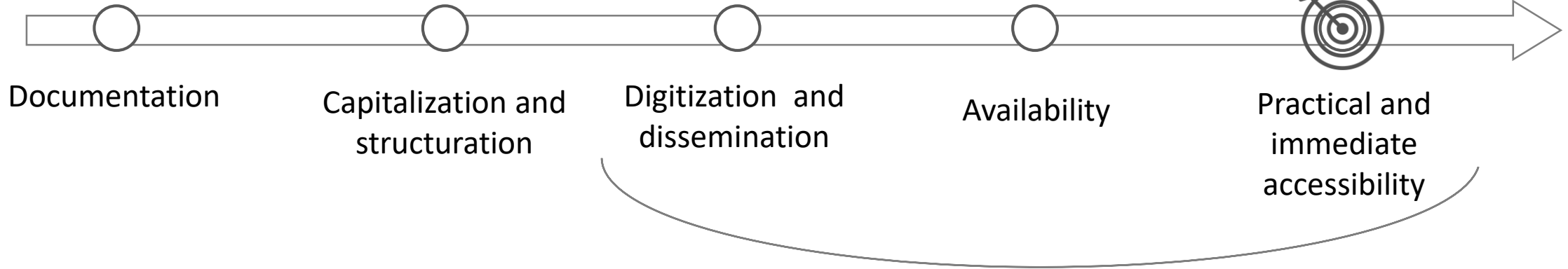
Architectural design
Architectural heritage conservation
...



Tasks requiring a perfect knowledge
of the construction materials and
implementation techniques.

3

4



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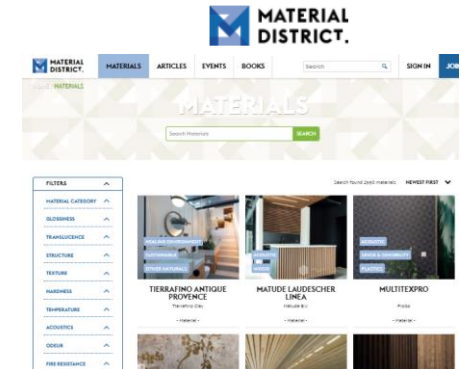
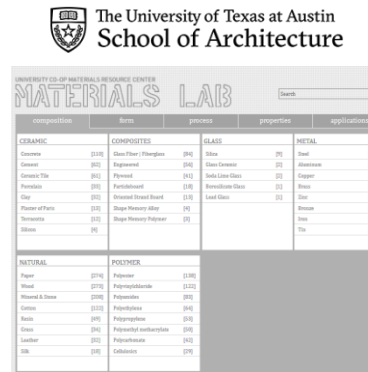
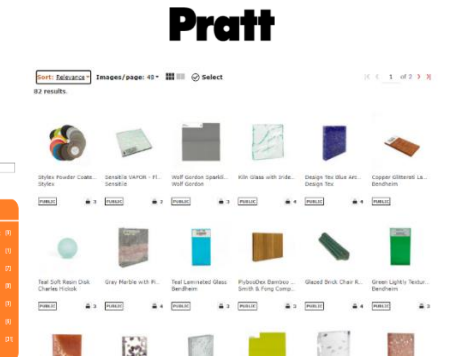
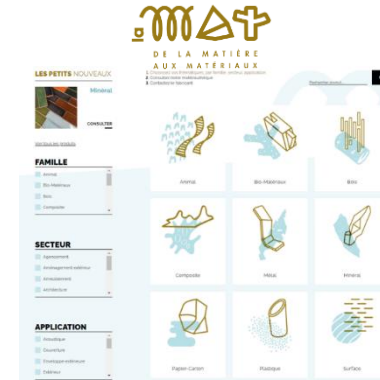
Unavailability of digital tools to practically manage and
access materials and techniques information in Algeria !

1 — Introduction-Context

Motivation

Unavailability of such tools in Algeria

Importance of building materials thorough knowledge.



➔ Digital material libraries for building materials knowledge vulgarization : basics aspects

➔ Algerian architectural heritage digital materials library : project features

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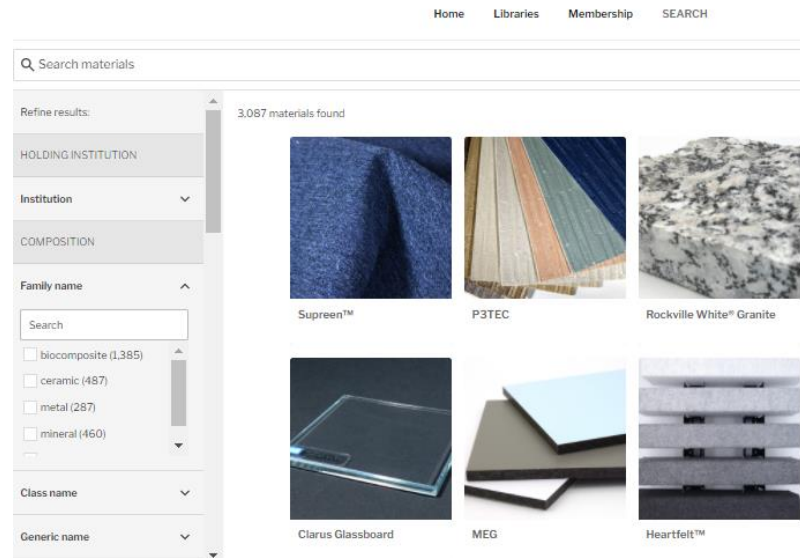
Introduction-Context



The content vary depending on :

- ➔ character and purposes of the institution
- ➔ nature of the samples (Raw materials, Building materials/products, finished objects)

Material Library (as a real space)

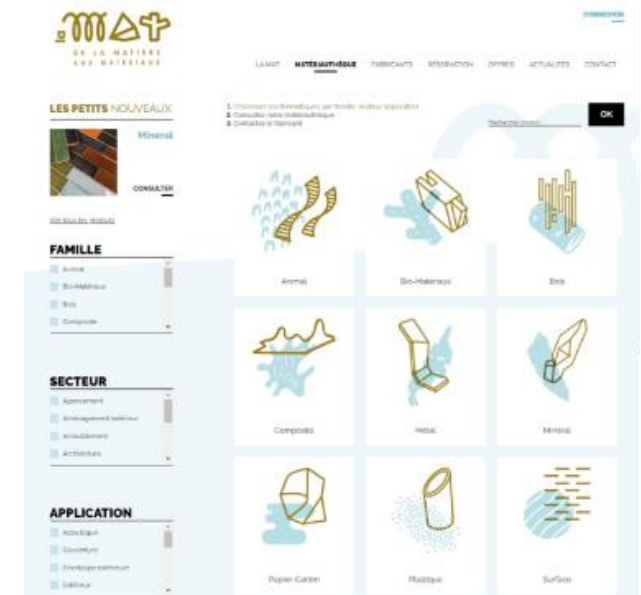
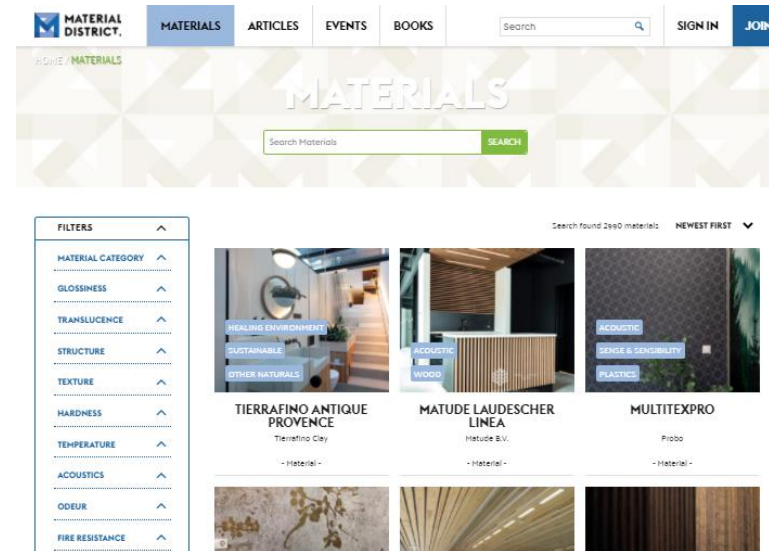
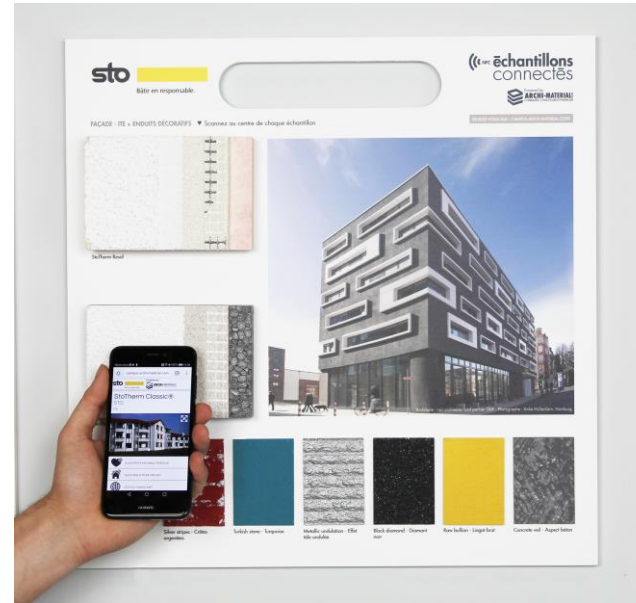


Digital material library

2 — Why digital material libraries ?

- Interesting examples developed under diverse contexts, with different scopes
- Facilitate the understanding of their functioning and allow to suggest new ideas and aspects
- Flexible tool, customizable and adaptable in content and form
- Practical and decision-support tool*
- Gap = unavailability of such tools in the Algerian context

FAIR principles	Findability Accessibility Interoperability Reusability
Forms of digital access	<ul style="list-style-type: none"> - Connected material libraries - Digital material libraries accessible without connection to the physical samples - Material libraries existing only in digital version
Content organization	
Search modes	
Search results	



FAIR
principles

Forms of
digital
access

**Content
organization**

- Material family / composition
- Use / application
- Manufacturing process, State / nature, form, appearance aspects, origin and provenance

Search
modes

Search
results

Materials Research Collaborative

Metals	Polymers	Ceramics	Natural Materials	Hybrids
F-ferrous [40]	C-composites [50]	C-concrete [48]	BP-biopolymers [11]	CC-ceramic/ceramic [9]
NF-non ferrous [66]	E-elastomers [52]	FC-fired clay [18]	EM-earthen materials [22]	CM-ceramic/metal [1]
	TH-thermosets [28]	G-glass [63]	NF-natural fiber [73]	F-fiberglass [7]
	TP-thermoplastics [63]	S-stone [41]	W-wood [122]	MM-metal/metal [0]
				MN-metal/natural [3]
				PM-polymer/metal [6]
				PN-polymer/natural [31]

Gerald D. Hines College of Architecture

University of Houston

AIA Trust

About

Contact

UNIVERSITY CO-OP MATERIALS RESOURCE CENTER

MATERIALS LAB

applications

SITE WORK	FACILITY CONSTRUCTION	OPENINGS & PROTECTION	CLADDING & FINISHES
Site Improvement [105]	Fabrication [380]	Thermal & Moisture [164]	Wall Systems [836]
Planting & Preparation [43]	Framing [101]	Windows & Skylights [130]	Flooring & Tiling [635]
Layer Separation [38]	Woodworking [58]	Doors & Frames [75]	Roofing & Siding [227]
Soil Stabilization [35]	Decking [54]		Countertops [208]
Slope Protection [29]	Masonry [43]		Ceiling Systems [139]
Erosion Control [28]	Instrumentation [24]		Painting & Coating [133]
Site Remediation [14]			Acoustic Treatment [127]
Pollution Control [11]			
FURNISHING	ELECTRICAL & LIGHTING	COMMUNICATION	
Upholstery [172]	Indoor Lighting [27]	Visual Display Surfaces [62]	
Cabinetry & Woodworking [132]	Outdoor Lighting [19]		
Window Treatment [105]			
Hardware [37]			

FAIR
principles

Forms of
digital
access

Content
organization

Search
modes

- Predefined headings
- Text entry or keywords
- Images can be used as : search mode, search result, or both

Search
results

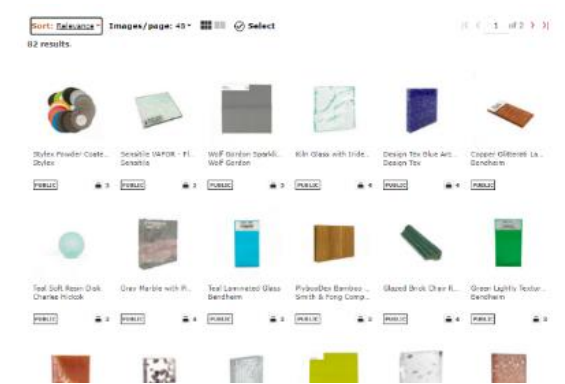
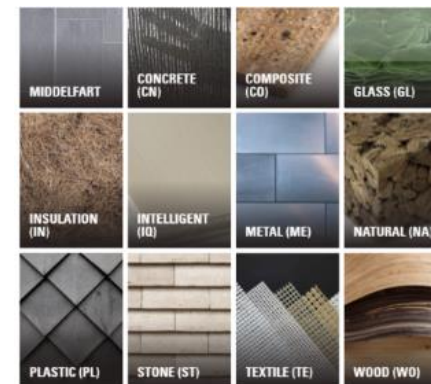
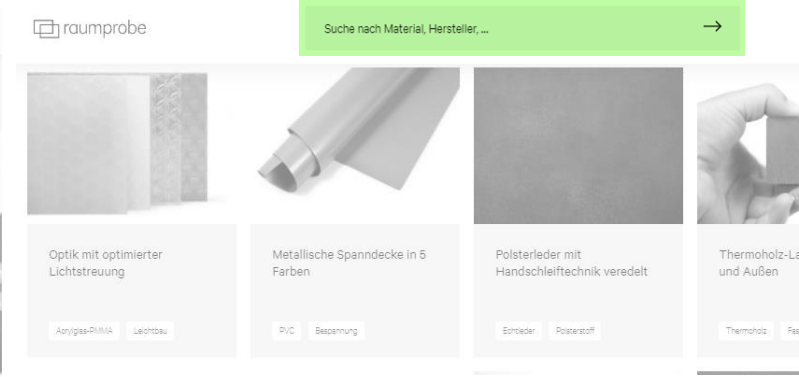
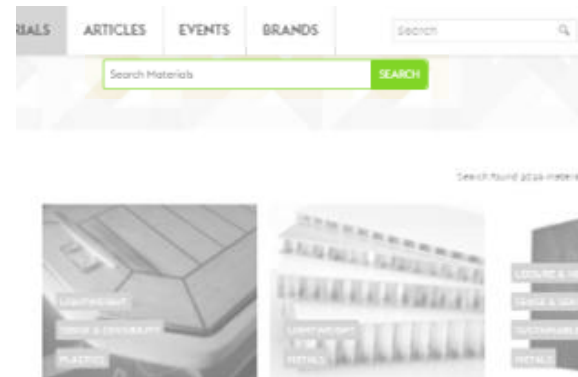
composition	form	process	properties
CERAMIC	COMPOSITES	GLASS	
Concrete [110]	Glass Fiber Fiberglass [84]	Silica [9]	
Cement [62]	Engineered [56]	Glass Ceramic [2]	
Ceramic Tile [61]	Plywood [41]	Soda Lime Glass [2]	
Porcelain [33]	Particleboard [18]	Lead Glass [1]	
Clay [32]	Oriented Strand Board [13]	Borosilicate Glass [1]	
Plaster of Paris [13]	Shape Memory Alloy [4]		
Terracotta [12]	Shape Memory Polymer [3]		
Silicon [4]			

FAMILLE

- Animal
- Bio-Matériaux
- Bois
- Composite

SECTEUR

- Agencement
- Aménagement extérieur
- Ameublement
- Architecture



FAIR principles

Forms of digital access

Content organization

Search modes

Search results

- General information, Illustrations, Technical data...
- Application, Provenance...
- Manufacturing processes, installation techniques, maintenance
- Appearance aspects
- Ecological and environmental data
- References, downloadable documents

Accoya™
acetylated wood

Samples at Harvard University Graduate School of Design ↗
Samples at Rhode Island School of Design ↗

Accoya™ is an alternative to tropical hardwood and arsenic or chromium-treated wood. Accoya™ may be used above or below ground, in all weather conditions and fresh water marine applications. Using the non-toxic process of acetylation on wood from sustainable sources, Accoya™ is a naturally renewable resource with improved durability, strength and UV stability. Accoya's ability to absorb water is greatly reduced, rendering the wood more dimensionally stable and, extremely durable. The process completely penetrates the wood leaving no untreated surfaces when cut or jointed.

Composition
biocomposite - plant - radiata pine

Typical use
marine, exteriors, cladding, decking

Featured application
Moses Bridge

Production
Company: Titan Wood Limited (manufacturer)
Accoya's Technologies PLC (manufacturer)

Place: Arnhem, Netherlands (origin)

External links
Accoya ↗

Form
Common form: lumber

Form type: profile - solid, sheet - rigid

Properties
Durability: fungal resistant
dimensionally-stable
UV resistant
animal resistant
bacterial resistant

Hygro-thermal: vapor permeability
Note: water permeable


Mechanical: density
Note: 27-37 lbf/cu ft
hardness
Note: 922 lbf (side)
hardness
Note: 1,484 lbf (end)

Property note: More durable than teak. Hardness is similar to soft maple, American cherry, or American walnut.

Material ecology
Lifecycle component: Recyclable - 100%
Renewable resource

Certification
Cradle to Cradle - Gold Level
Forest Stewardship Council (FSC)

Processes
Additional process: acetylation



MISAPOR STANDARD 10/75
MISAPOR

Description
Isolation sous fondation (citer ou sous dallage)
Lorsqu'il n'est possible d'obtenir une isolation durable (à 80% du sol de fondation, des nombreuses raisons font que le granulat de verre cellulaire MISAPOR est le premier choix de la matière.
MISAPOR offre non seulement une isolation parfaite, mais stabilise aussi la surface de construction et contribue par sa performance élevée au respect de l'énergie et d'économie. Même en termes de pose, le verre cellulaire dans le haut du pavé - une fondation complète pour une maison avec MISAPOR sous votre permis d'économiser jusqu'à 2 jours de construction.
Isolation verticale de mur extérieur
MISAPOR permet aussi d'isoler des éléments de construction verticaux comme les murs de caves.
À l'image de MISAPOR, la réalisation de ce système exemplaire de joints thermiques et optimisés sur le plan énergétique est d'une grande simplicité. Les trappes ne nécessitent aucune réglage. Elles sont garnies avec du verre cellulaire. Les trappes sont remplies de granulat de verre cellulaire. Une méthode simple, plus rapide et à moindre coût.
Caractéristiques
Isolation thermique comprenant une couche diamante et une couche anti-impact
Construction exempte de joints thermiques
Suppression de la formation de moisissures qui se voit sur le plan statique
Change constant de visibilité à la grande distance à la conception

Caractéristiques

Poids	140 kg
W 600	600 mm
Longueur	0.27 m
Largeur	0.40 m
Prix	Jeune offre
Endurance	Stable

À savoir en savoir
C'est un bois robuste et léger couramment utilisé dans la construction des charpentes, les murs, les couvertures bois ou encore pour des extensions de maisons en bois. Très facile, il résiste à l'humidité lorsqu'il est bien protégé, conserve mais relativement léger. Donc facile à travailler et permettant un chantier plus rapide, cette essence est plus appréciée en raison évidemment de son coût réduit.
En revanche, le bois doit être traité classe 4 car il n'est naturellement pas protégé contre l'humidité, ce qui pose un problème en particulier pour le bardage mais aussi pour l'ossature, qu'il faut être bon d'entretenir en classe 3 minimum pour éviter les dommages sur le long terme.

Accessoires
MISAPOR La gamme de grandes.pdf
MISAPOR Profil F500.pdf
MISAPOR Manuel technique.pdf

Bamboo Plywood

This is a textiles & crops material
Textiles are a by-product produced by weaving, knitting or felting. Crops are grown from their fibres traditionally used to make paper, cloth or rope.

Geographic Availability
Woodwide

Origin / Location Of Manufacturing / Processing Plant
China

Application And Typical Uses Of The Product
Construction, Wall Paneling, Ceiling finishes, Furniture production, Bespoke Kitchen production

Is The Resource Renewable Or Finite?
Renewable

Does The Material Need To Be Processed Further Or Treated By The User?
Smith & Fong Bamboo Plywood comes untreated or finished. Commonly it would either be lacquered or oiled to suit. It can be stained or coloured to any RAL colour if required.

Sustainability - How Complex Is Installation? What Skill Level Is Required?
Normal woodworking machinery is required

Disassembly And Re-use
Yes, Bamboo can be re-used and re-purposed

Disposal End Of Life
End life can be remanufactured and repurposed

Types, Textures, Specifications And Colours Currently Available
A wide range of colours, textures, finishes and thicknesses are available

Supplier Name
Smith & Fong

Main Contact
Rob Haynes / Angela Haynes

Contact Address
54 Springdale, Howard Road, Redditch, Park Farm Industrial Estate B967SL UK

Telephone Number
0745 333 8 300

Website
https://www.smithandfong.com

Is This Product Certified?
Yes, FSC, NAUF, ULF, need certified

Lifespan Of Materials If Maintained Correctly (Years)
50 years plus

Availability - How Easy Is It To Source The Material
Yes, Available Globally through Plyboo approved certified Distributors

[Download data sheet](#)

Application case in the Algerian context

Digital material library relevance in the local context

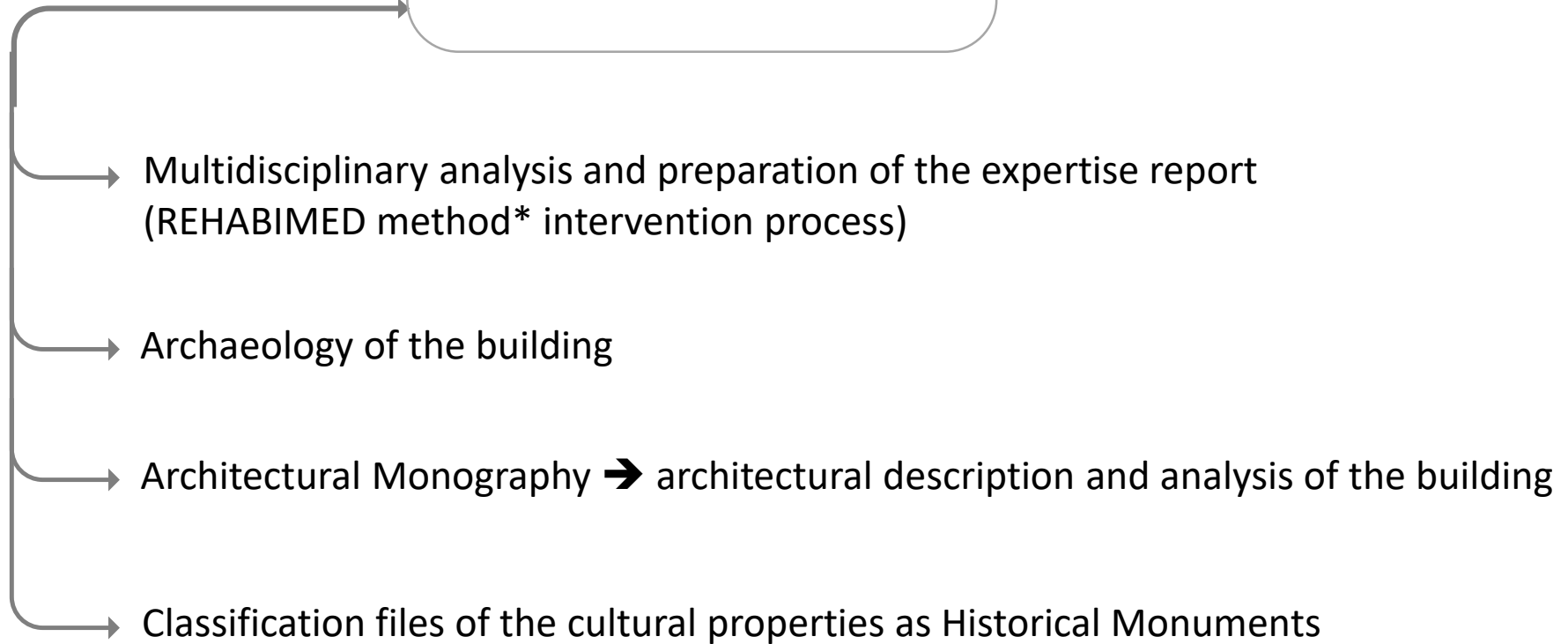
Suitable material/
appropriate treatment
method selection



Perfect knowledge of the
aspects related to materials
and construction techniques



A digital material
library in the Algerian
built heritage context.



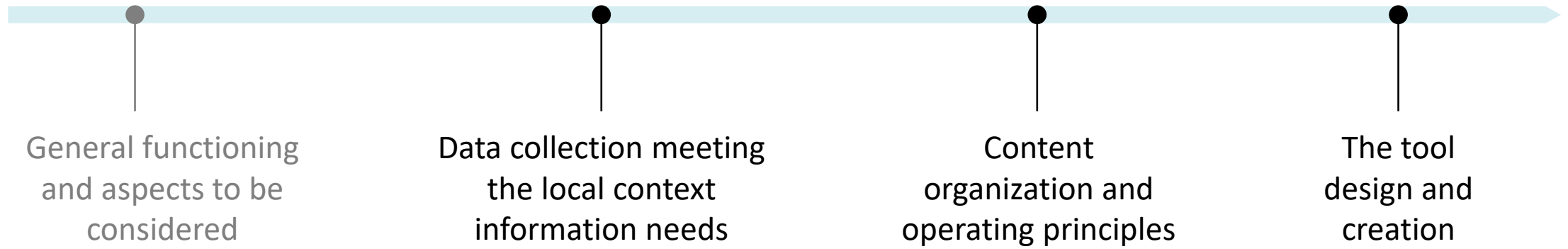
- Hierarchical levels
- The use of common categories, for non-professional users
- Aspects particular to the architectural heritage field : geographical region, historical period, constructive typology...

Taxonomy development based on published literature and controlled vocabularies in the field

Research results must allow :

- Identification of the material and its technical characteristics/properties
- Uses (By product/ by location in the building/ by project)
- Implementation techniques
- Pathologies (Related to materials and implementation techniques adopted)
- Treatment or strengthening techniques

Algerian architectural heritage digital materials library



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ECOLE POLYTECHNIQUE D'ARCHITECTURE ET
D'URBANISME "EL MOUDJAHID HOCINE AIT AHMED"



Laboratoire Ville, Architecture et Patrimoine

Thank you !

Digital Material Libraries Overview and application case

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