

Developing a synthesis process for producing schematic maps from cognitive maps

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The Map of the Future May Not Be a Map.

Ed Parsons

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How can we design maps to a world in which
'intelligence' will be embedded in virtually
everything around us?

Rethinking Maps

Edited by
**M. Dodge, R. Kitchin and
C. Perkins**



Routledge Studies in Human Geography

What is schematization?

In Cartography...

It is one aspect of map generalization.

“..... application of a set of algorithms to geographic data (represented in vector form) in order to control the optimal representation of geographic phenomenon at a range of different scales or levels of detail.”

(Encyclopedia of GIS 2008)

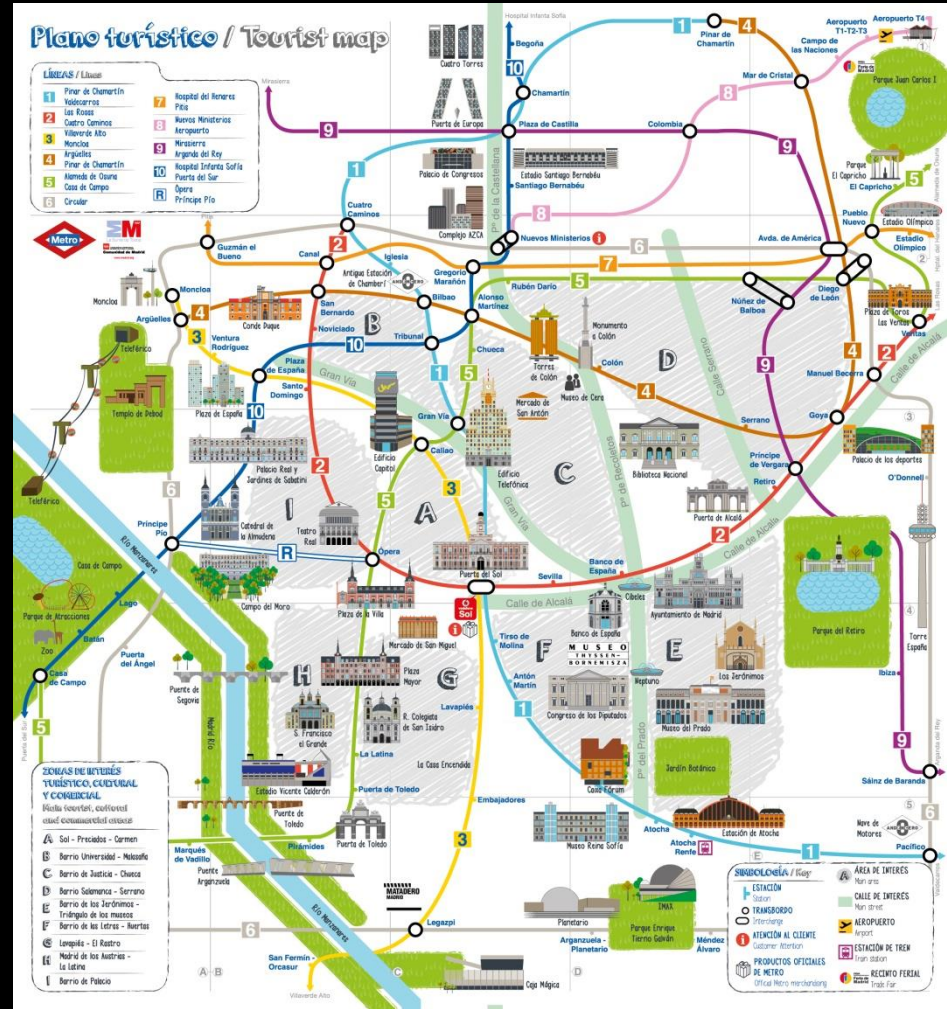
Schematic Maps

They represent a specific knowledge needed for a given task.

Aspects that

- needs to be represented unaltered;
- can be distorted but needs to be represented;
- can be omitted.

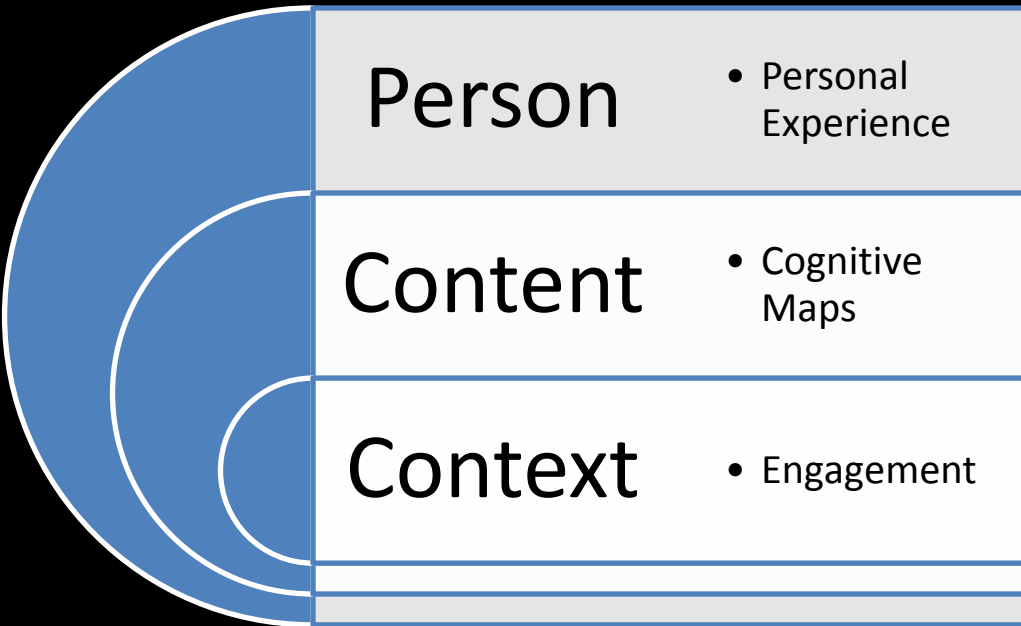
Schematic Maps



Rethinking Schematization

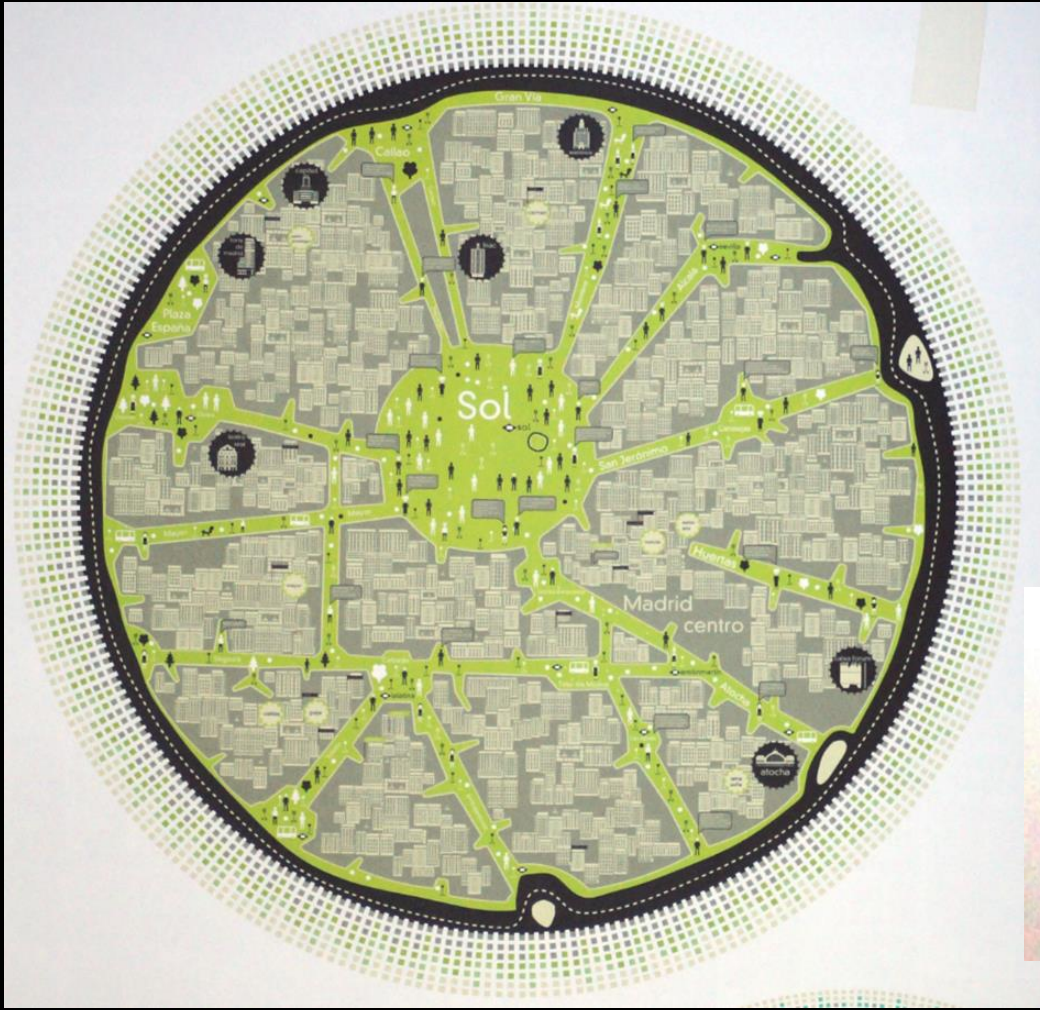
- ... is a process to synthesize the cognitive behaviour of a personal experience of a place as the intersection of where smart connected things will engage with humans.

Rethinking Schematization



The contents of schematic maps will be produced through the lens of a person experience of a place where smart connected things will engage with humans.

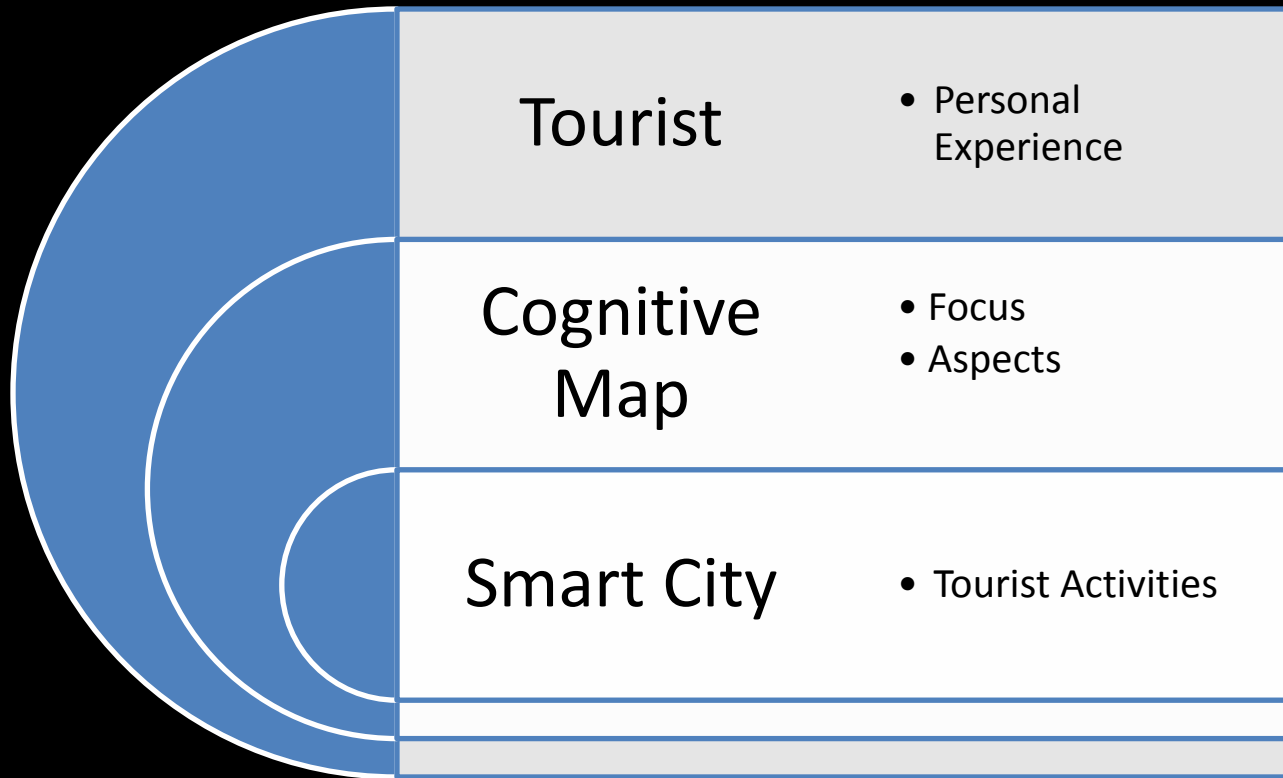
Rethinking Schematic Maps



COSMOGRAPHIES

◆ The Cosmographies project maps locations using personal experiences as a way to contribute to the understanding of place. The project is based on medieval mapping systems created by monks, which reflect personal visions of cities and routes by focusing on the circumstantial details of place.

Case Study



Survey Method

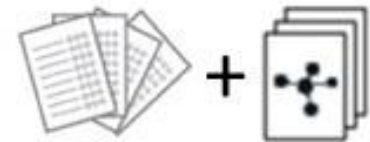
• First time foreigner tourist in Madrid

Research techniques



100 tourists
in Madrid

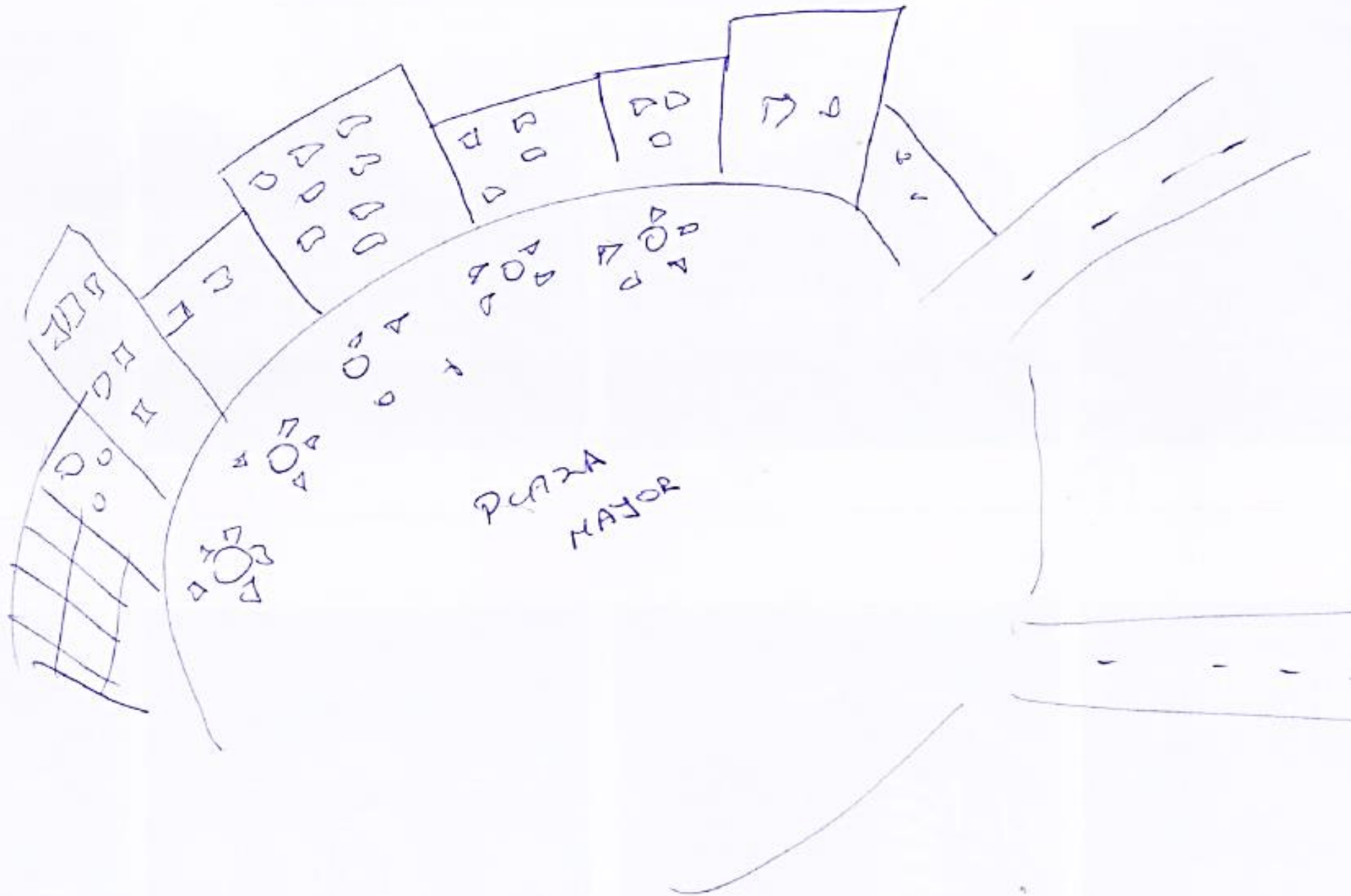
Questionnaire
and mental maps



Cognitive Behaviour

- Follower
 - Today: People who enjoy being guided during their visit and delegate their decision making to a friend or a tour guide.
 - Future: People who will let a smart place to make a decision for them.

Madrid



Cognitive Behaviour

- Explorer
 - Today: People interested in knowing the true essence of a place. They explore alone or accompanied, but not in an organized group .
 - Future: People who will interact with a smart place but make their own decision.

EL ESCURIAL

LOCAL TRAIN

4 Towers
Financial
District CHARMING

N

CASA
DE
CAMPO

FUNCLUB

STADIUM
REAL M.

SALAMANCA
SCULPTURE
OUTSIDE

MALASANA

GRAND VIA

SEVILLAS

SOL

H3

CENTRO

PLAZA
MAJOS

PARLMENT

RETRU
PARK

CRISTIN
PALACE

PARRIS

VERTICAL
GARDEN

CAMA
FORUM

BERNARD

EGYPT
PYRAMIDE

PRINCE SHOPPING
CENTRO

ROYAL
PALACE

LA LATINA
LA LATINA

H2

LAMP PIES

PYRAMIDE

L1

A-DOCA

NEW OLD
BRIDGE

H4

RIA
SOFIA

TRAMP
MUSEUM

VILA VALLEJO

H1

ART
OLUF
PALACE

OLD SWEDISH
HOUSE

RIO

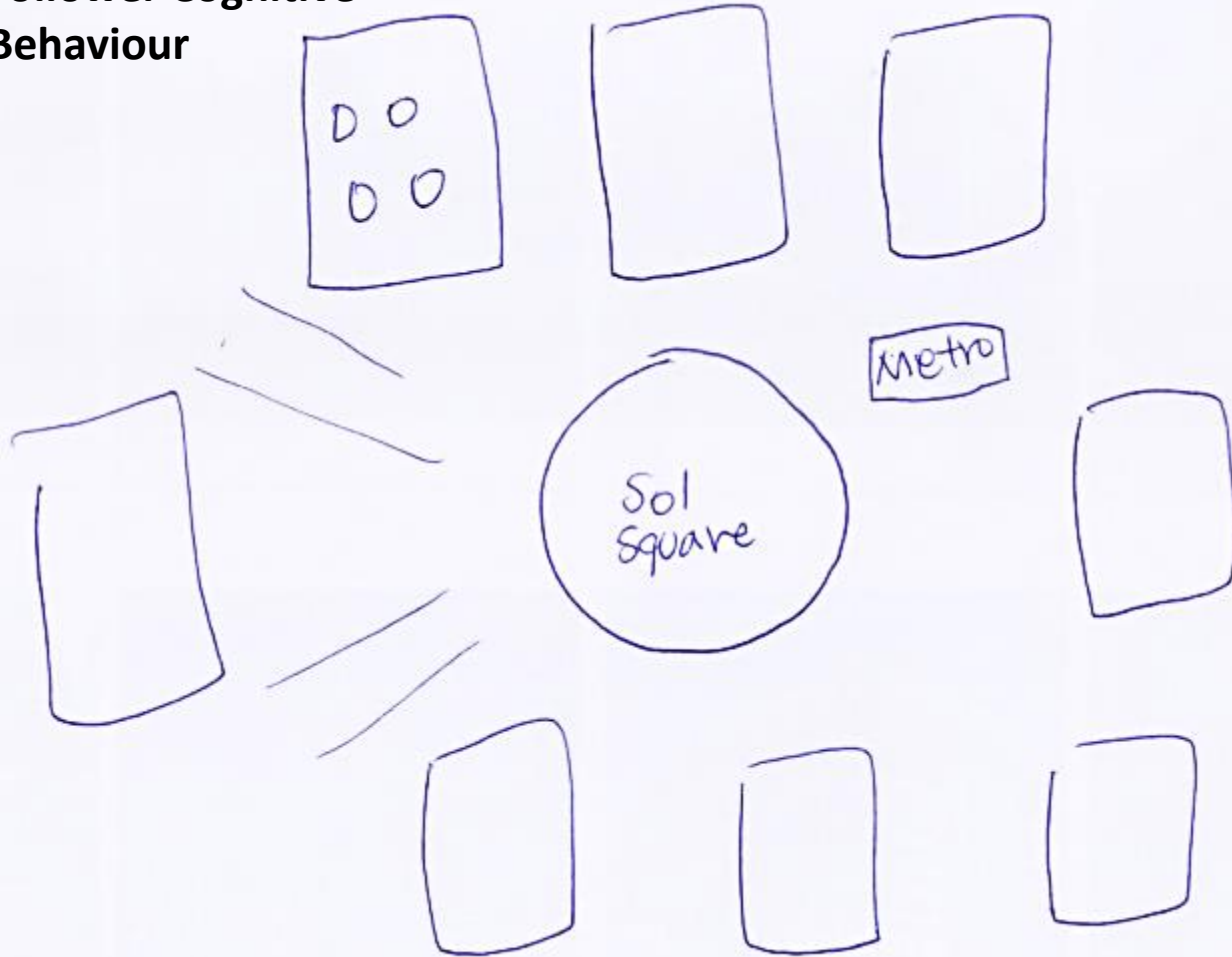
KRISTIAN 10 MAY

Schematization

- Focus
 - The frequent points of interest (P)
- Features
 - Synthetizing the points without any connections.
(P)

Type P

Follower Cognitive Behaviour



Schematization

- Focus
 - The frequent points of interest (P)
- Features
 - Synthetizing the points that connect lines.
(P \longrightarrow L)

Type P → L

Follower Cognitive Behaviour

16. Dibuje un mapa de la ciudad de Madrid, identificando los siguientes elementos:

- Lugares de interés
- Calles singulares
- Zonas de interés

→ N Norte

→ B Aeropuerto

* A Alojamiento

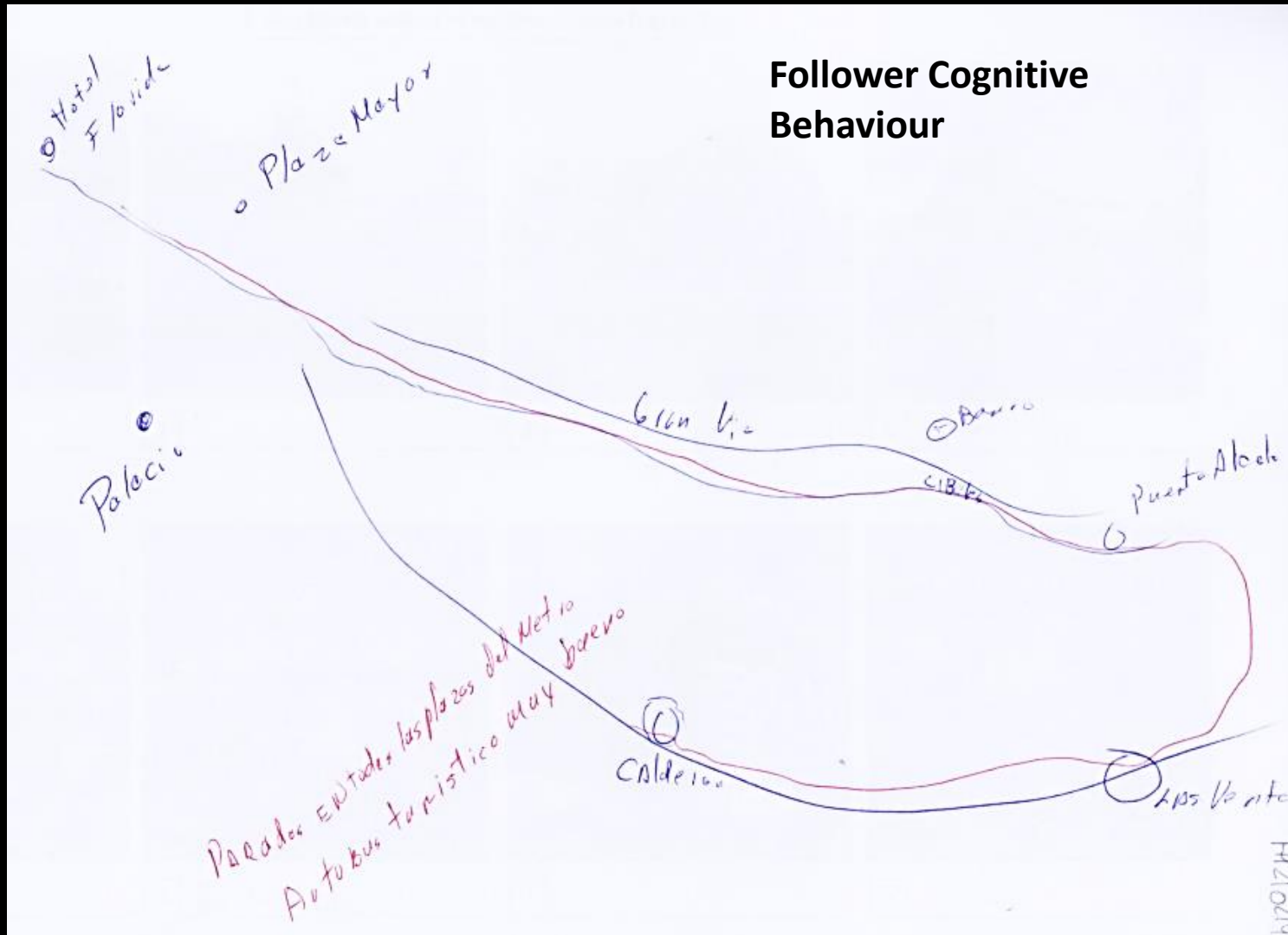
Dibuje en rojo, la información sobre las infraestructuras de transporte público: (líneas, estaciones, etc...)



Schematization

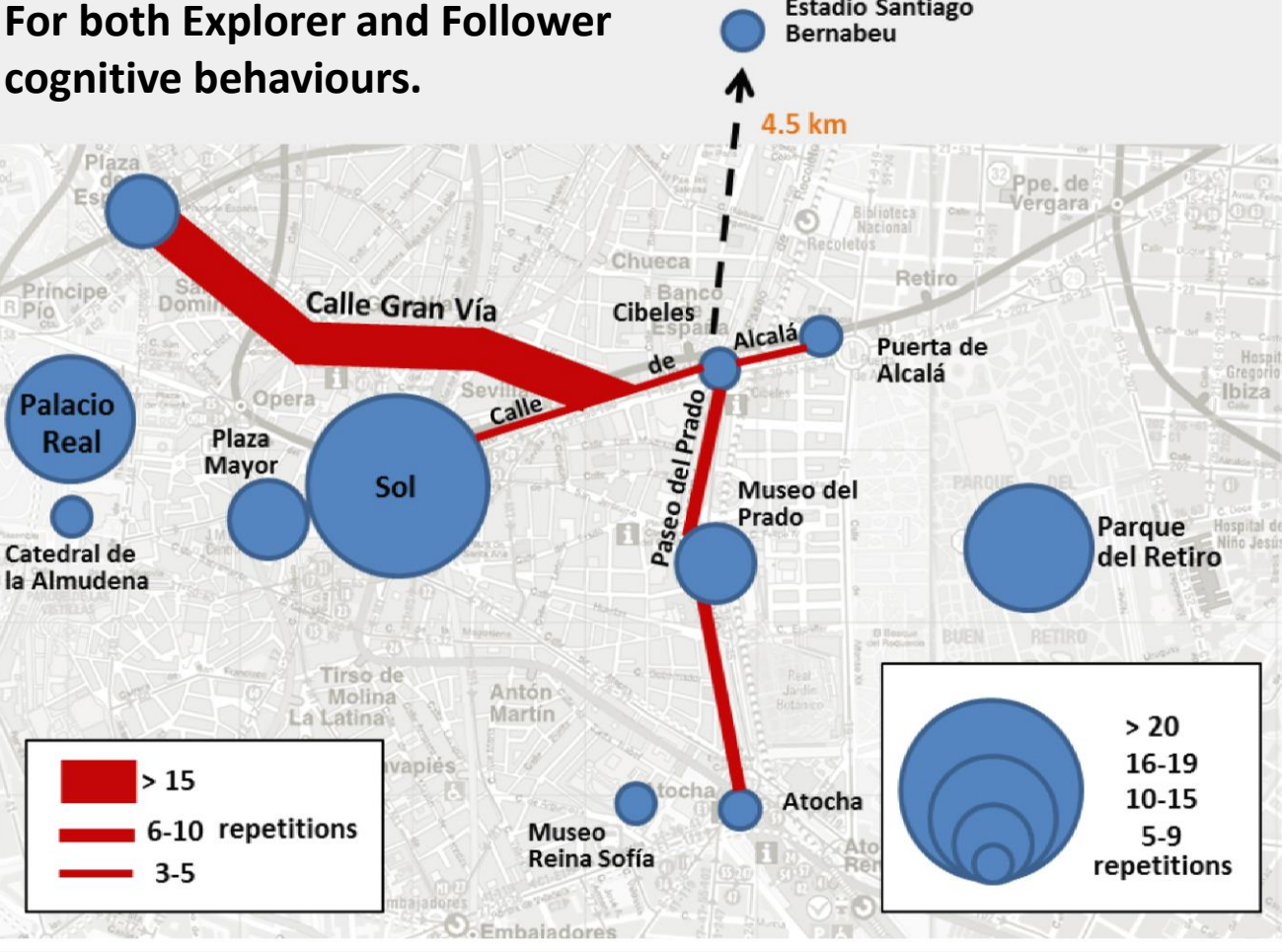
- Focus
 - The frequent points of interest (P)
 - The frequent lines of interest (L)
- Features
 - Synthetizing a line that connects points.
(P ← L)

Type P ← L



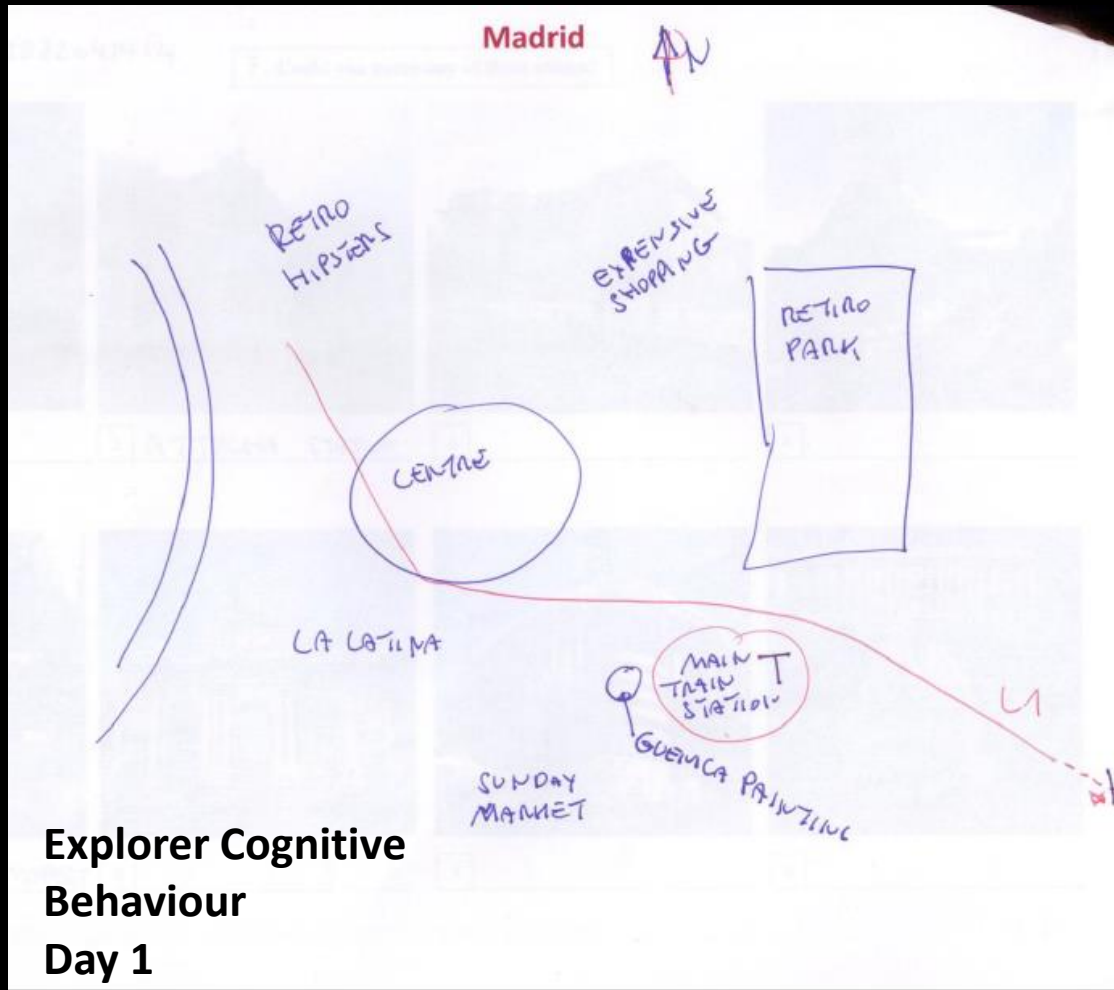
Schematic Map

For both Explorer and Follower cognitive behaviours.



Evolution

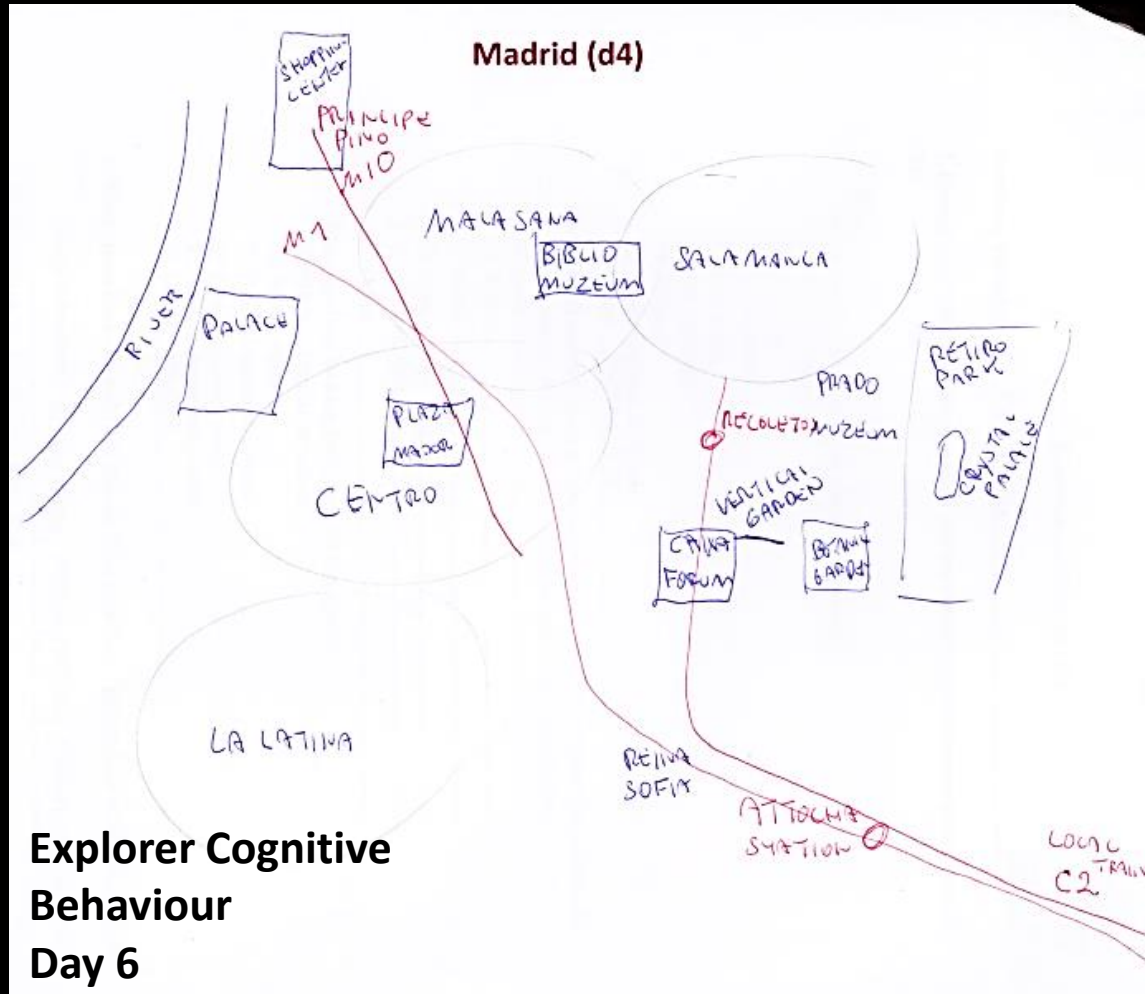
Beginning of the visit (P)



Explorer Cognitive
Behaviour
Day 1

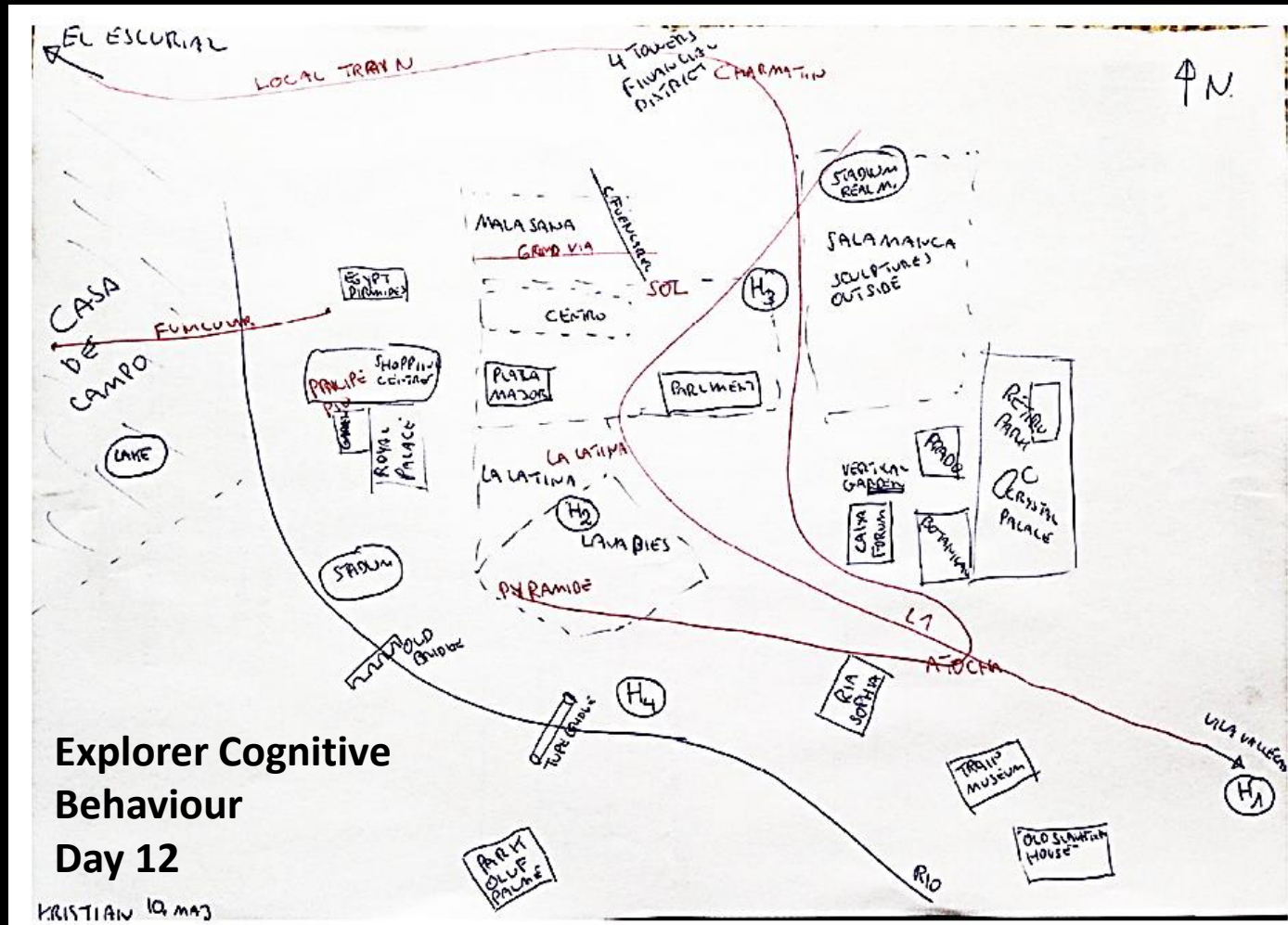
Evolution

During the visit $P \leftarrow L$

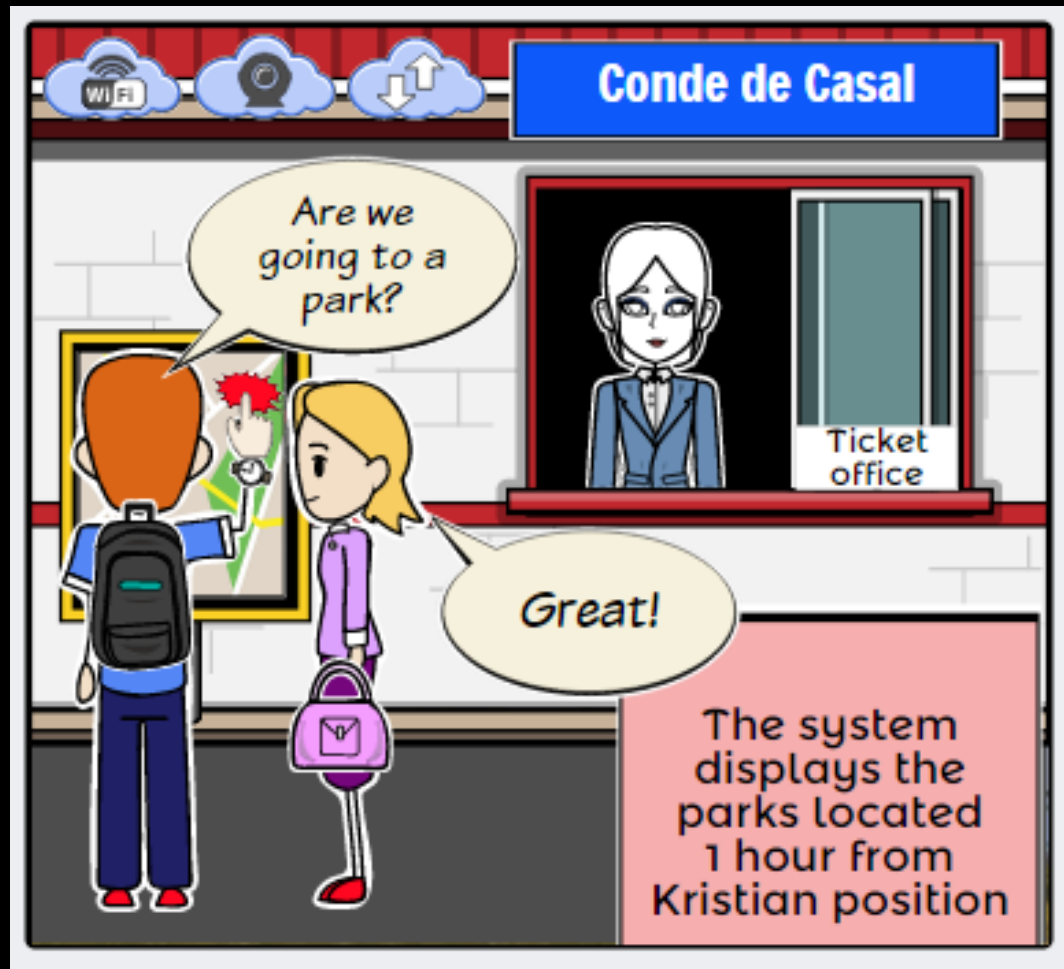


Evolution

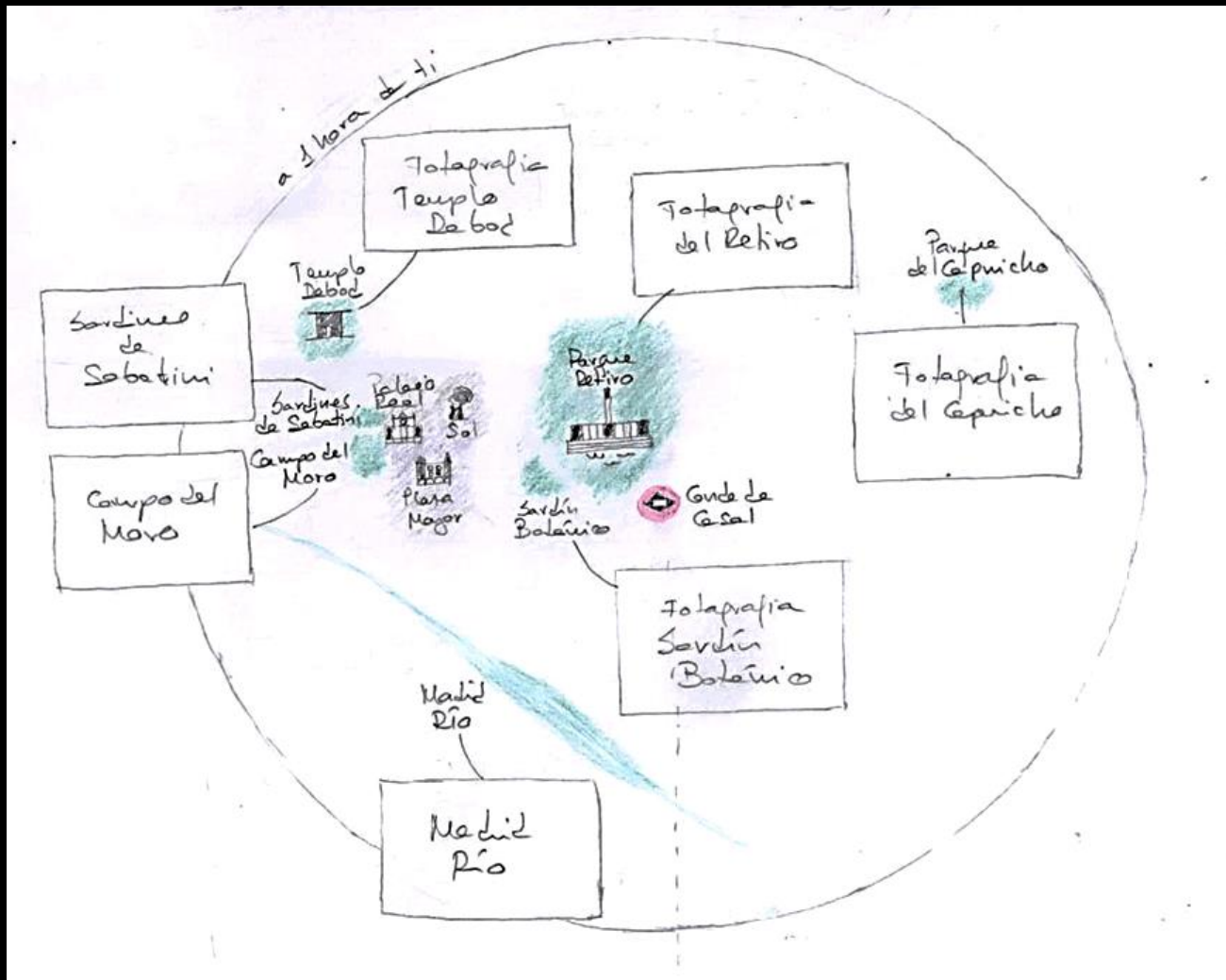
At the end of the visit (all)



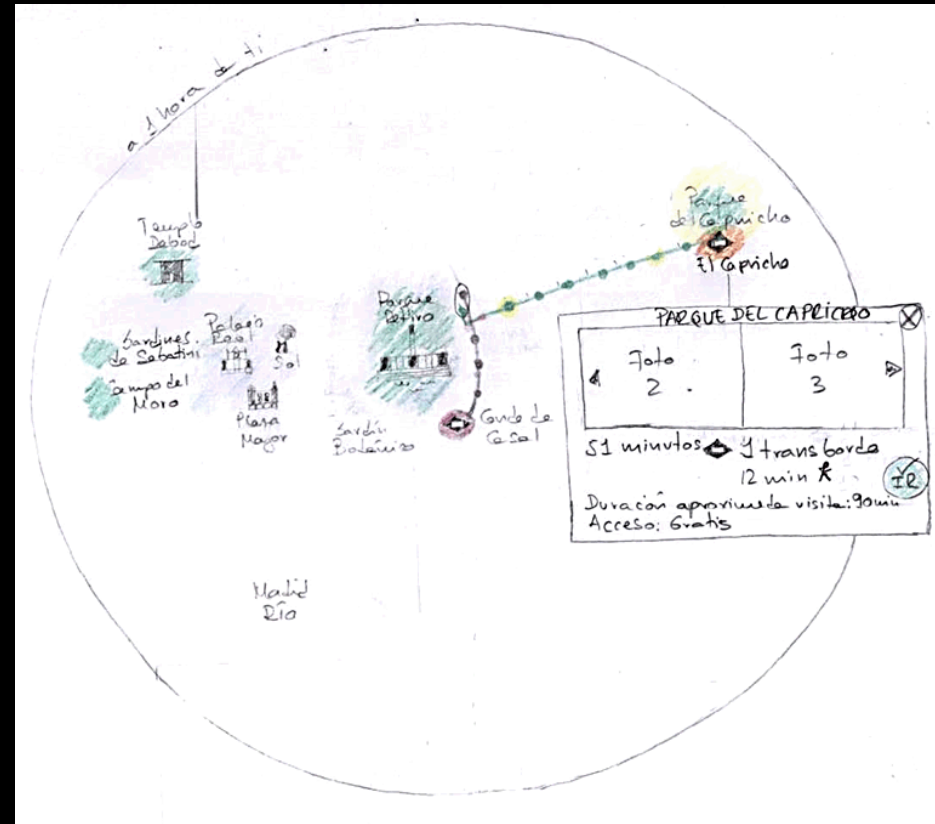
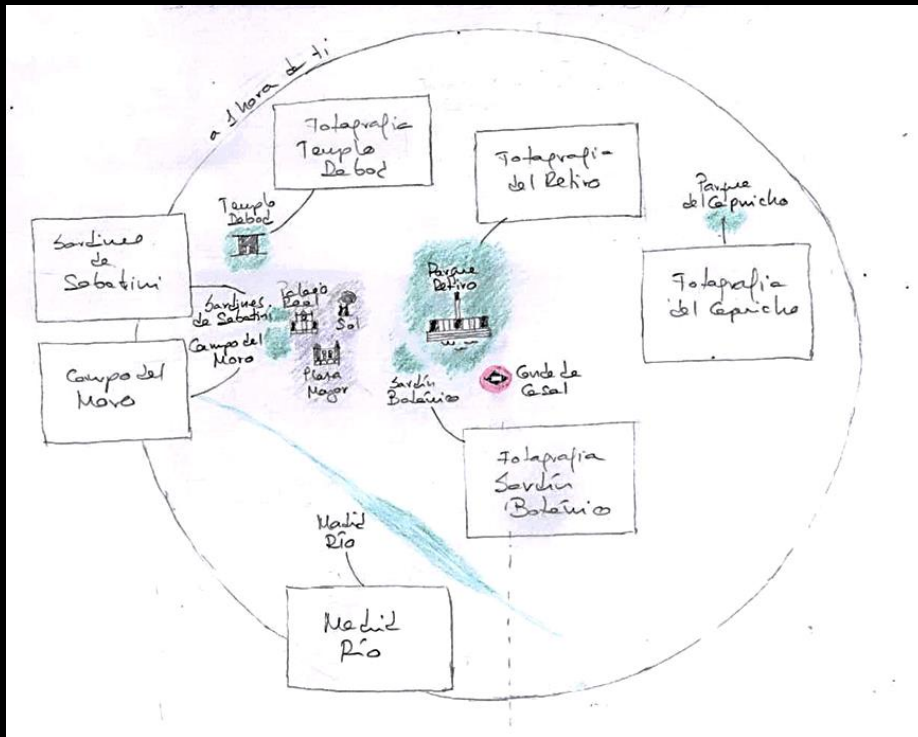
Schematic Map



Schematic Map Design



Schematic Map Design





Conclusions

We propose a new synthesis process for producing schematic maps from cognitive maps.

- represent a person experience of an intelligent place;
- be embedded, personalized, adaptive and anticipatory according to different activities happening over time;
- assist a person in making a decision requiring human-to-Internet of Things interaction.