

# Constructing Structured Data on Functional Hypotheses of the Brain

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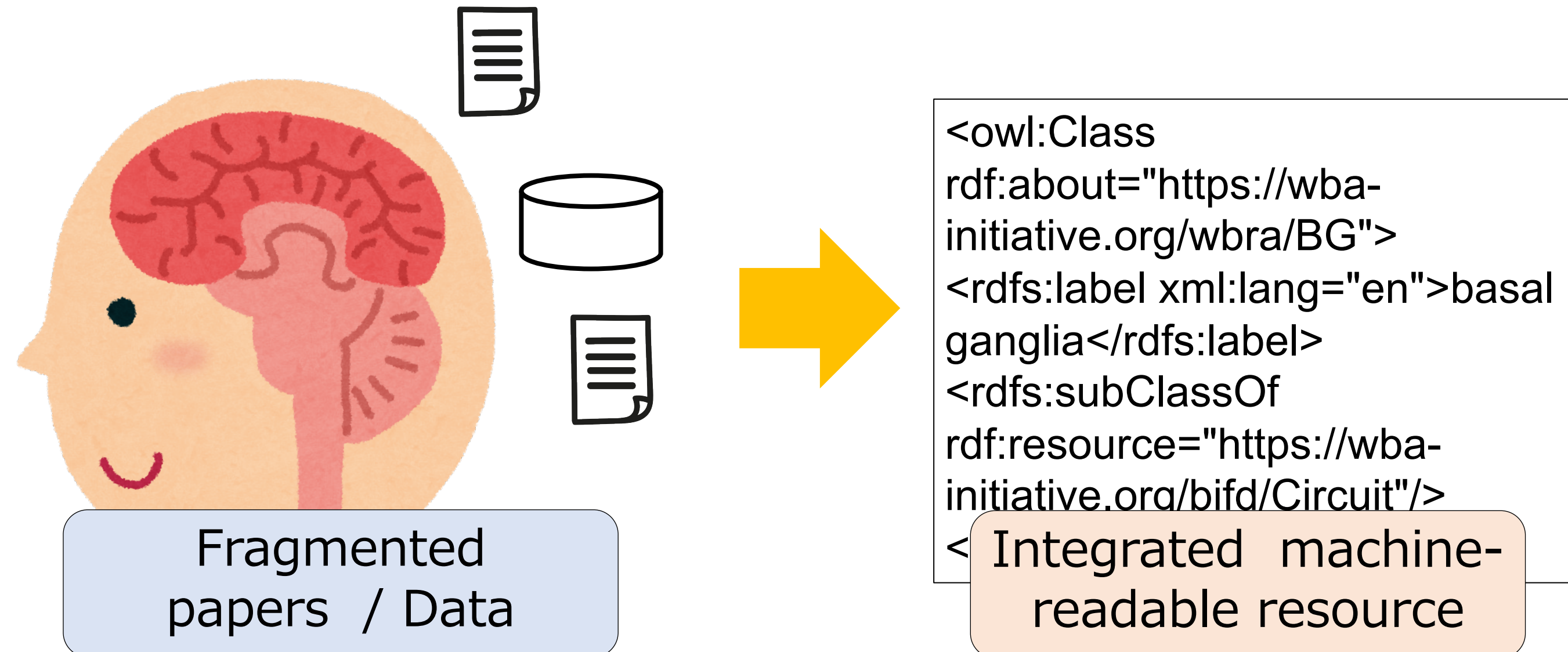
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## Background :

Neuroscientific knowledge (papers and data) including consistent computational functions in the brain, is the key in building brain-inspired AI systems or evaluation of biological plausibility for such systems. However, much of neuroscientific knowledge is still fragmented and they are not machine-readable, or reusable. Therefore, a "common language" for understanding the functioning of the entire brain is required.



## Approach:

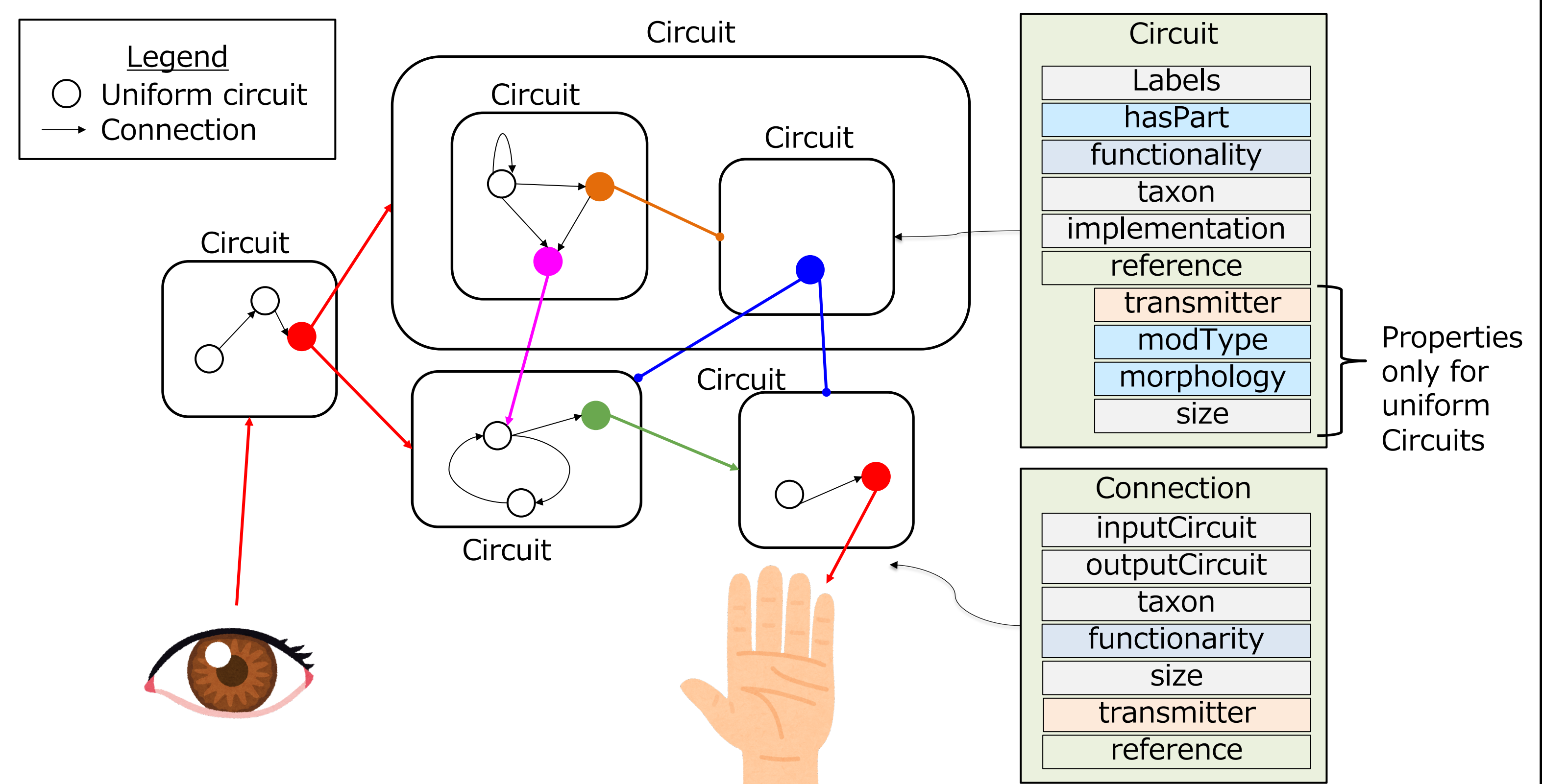
- BIF schema for structured data was proposed
- A data flow was designed that is friendly for contributors to register and for developers to use
- Tools to support the above flow were developed

## The Schema of Brain Information Flow (BIF):

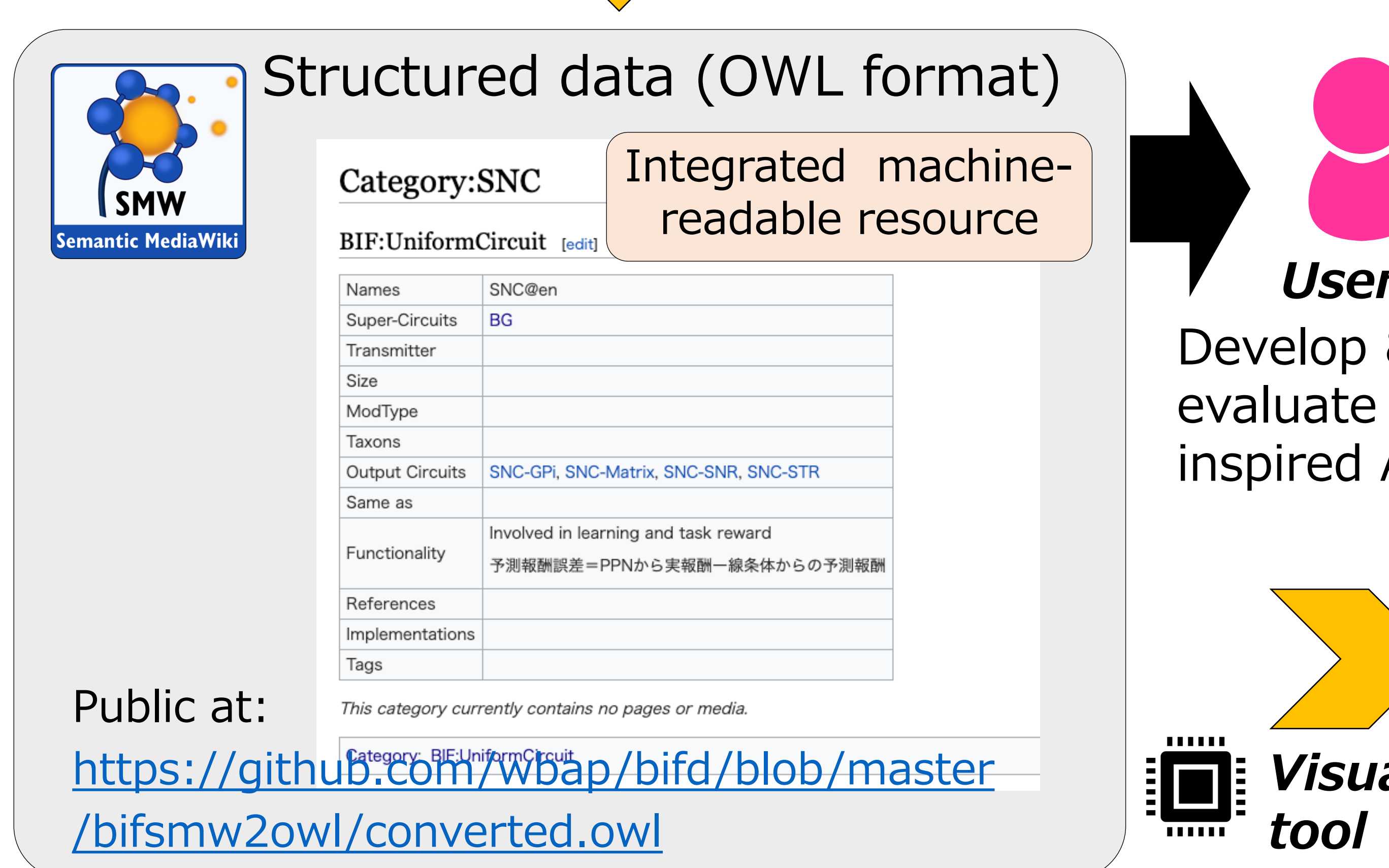
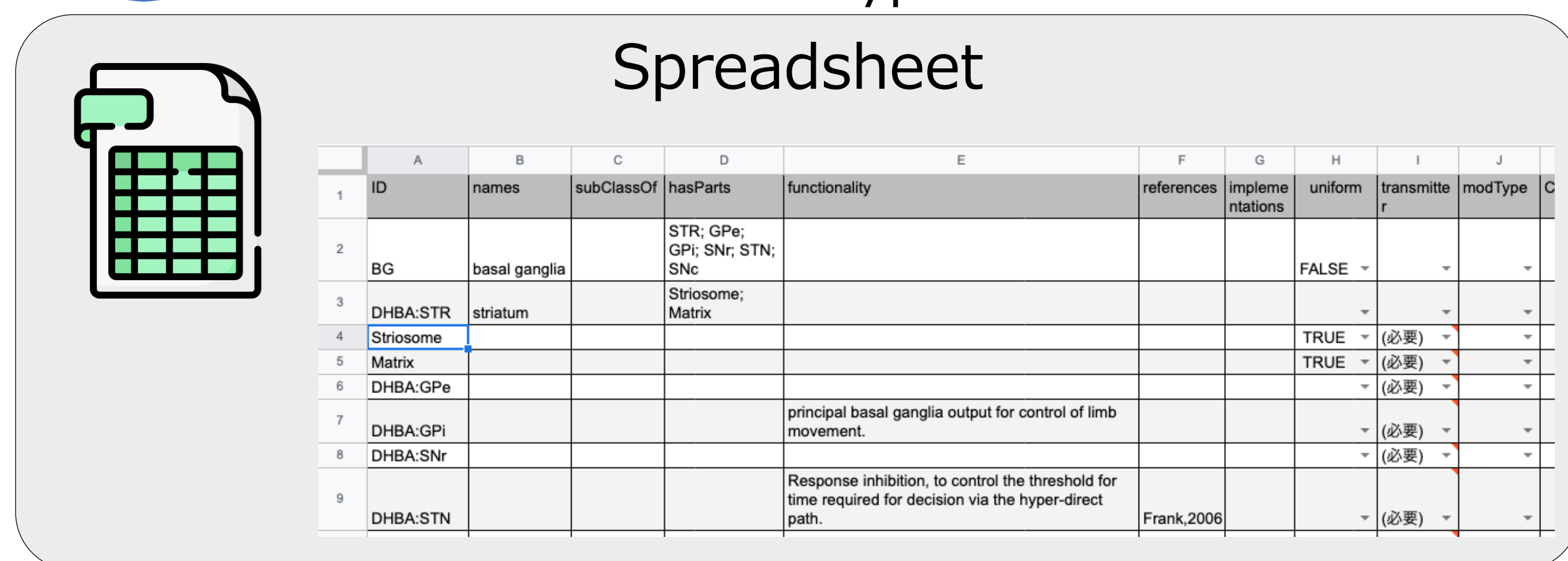
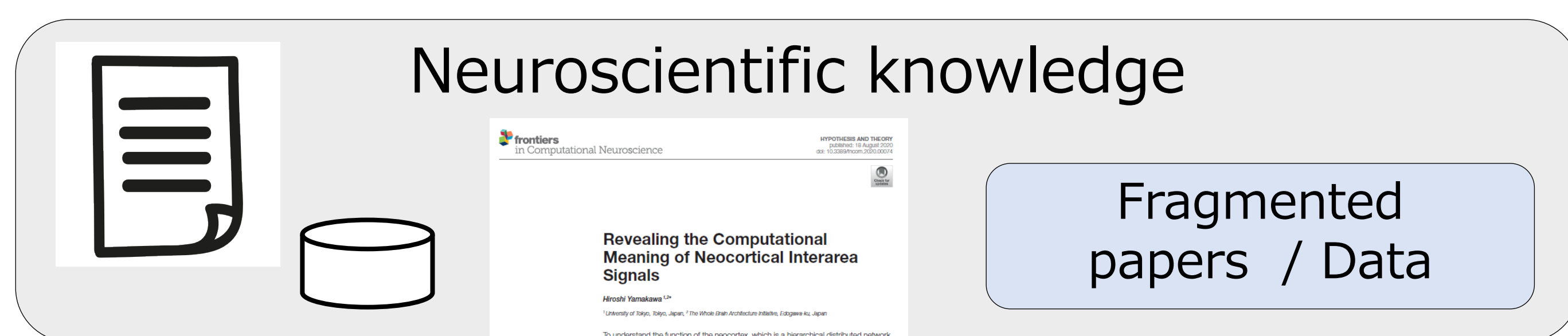
The proposed schema is designed to describe mesoscopic-level anatomical architecture of the brain and function on them.

It consists of 'Circuit' and 'Connection'.

- Circuit: a brain organ or a group of neurons that represents a function
  - functionality: description of functionality of the circuit in natural language text
  - Reference: reference to refereed paper
- Connection: a connection between Circuits.



## Data Flow: Friendly for contributors & users



## Estimated completeness

- ✓ functional hypothesis: 3%
  - ✓ anatomical structure: 20%
- Constructed data

- Basal Ganglia: 17 Circuits
- Prefrontal Cortex: 65 Circuits
- Eye Movement: 32 Circuits

## View of specific ROI with functionality (ex. ROI = Eye movement data)

