ThoughtWorks®

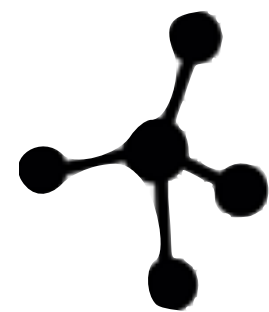# BUILDING SMART ECOSYSTEMS

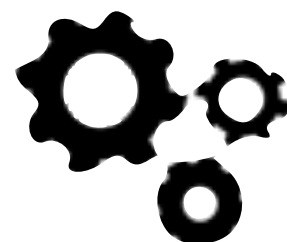**Michael Fait - @mfait**
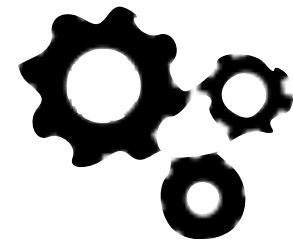
INTERNET OF THINGS

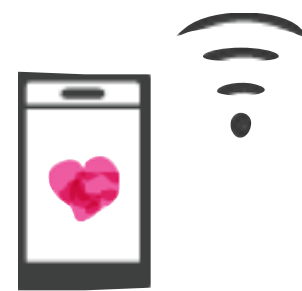**SMART DOMAIN**

MULTI LAYERED ECOSYSTEM

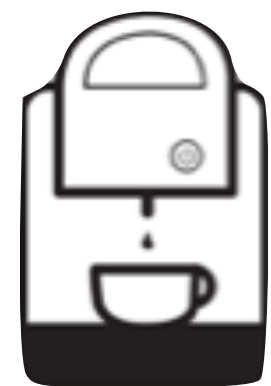**SMART ECOSYSTEM**

SMART ECOSYSTEM

CONNECTED DEVICE

SMART DEVICE

DEVICE

IoT

Smart Domain

Multi Layered Ecosystem ← very hard to implement as a single step

Smart Ecosystem

Connected Device

no/little user value → *Smart Device*
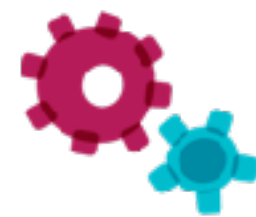
Device

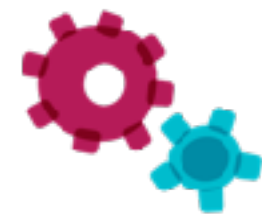**INFORMATION SYSTEMS**

Smart Ecosystem

EMBEDDED SYSTEMS

MOBILE SYSTEMS

EMBEDDED

MOBILE

INFORMATION

Business Models

Org Structure
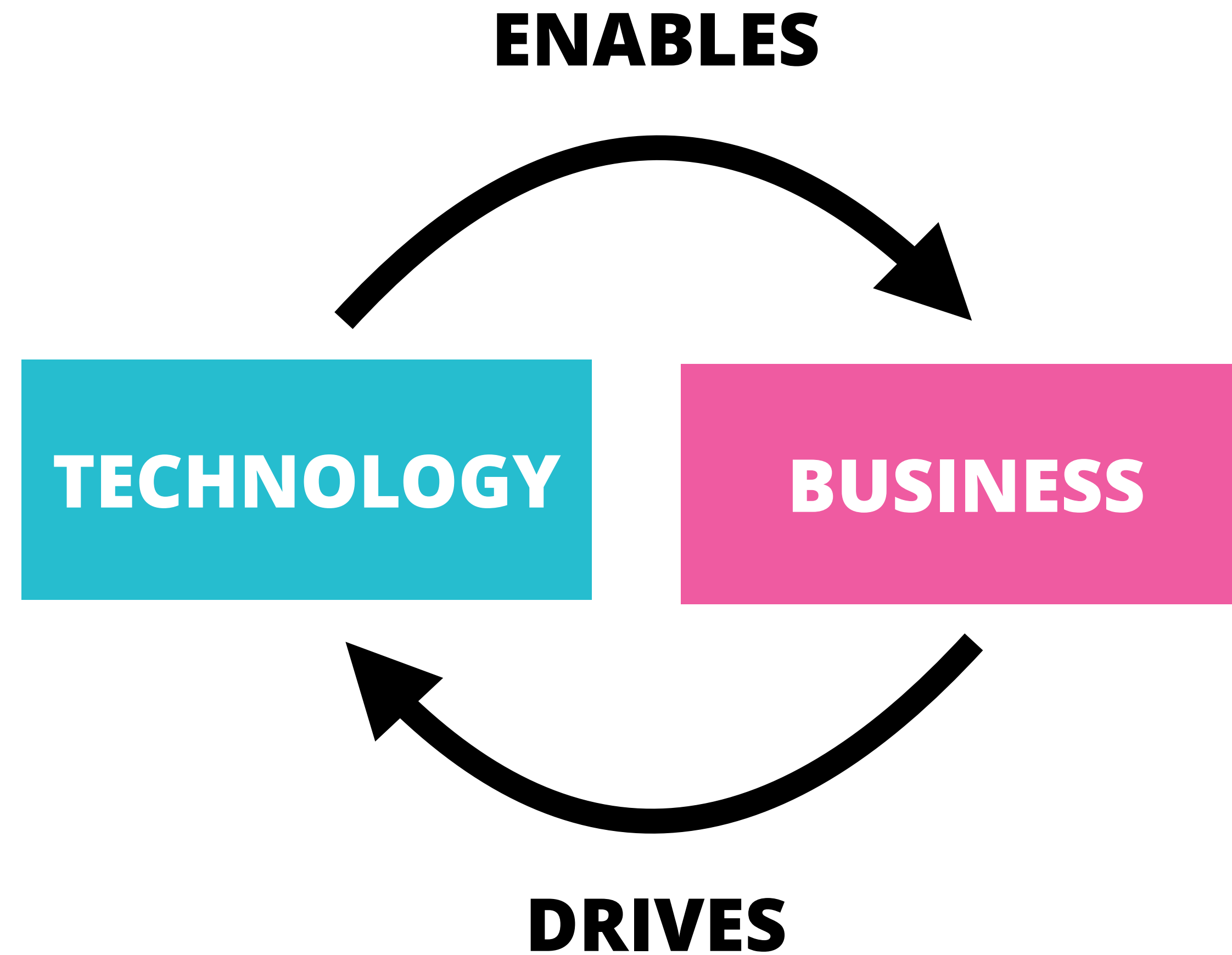
Experience Design

Privacy

Smart Ecosystem

Architecture

Development

Security

Testing

BUSINESS MODELS

Building Smart Ecosystems

ENABLES

TECHNOLOGY

BUSINESS

DRIVES

ENABLES

TECHNOLOGY

INSTRUMENT

1990

ANALYSIS TOOL

2000

2010

TRAINING ASSISTANT

2020

I don't want a watch

I WANT TO RUN FASTER

Instrument

Analysis tool

Training assistant

"Das Auto."   "Rent a car."   "Hello, mobility!"

ORGANISATIONAL STRUCTURE

Building Smart Ecosystems

Hardware

Connectivity
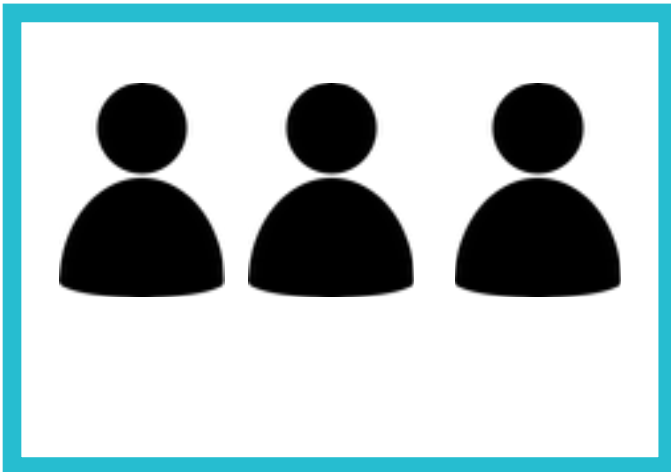
Infrastructure

Apps

User Research

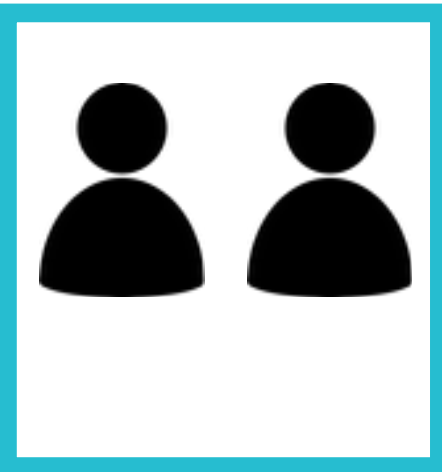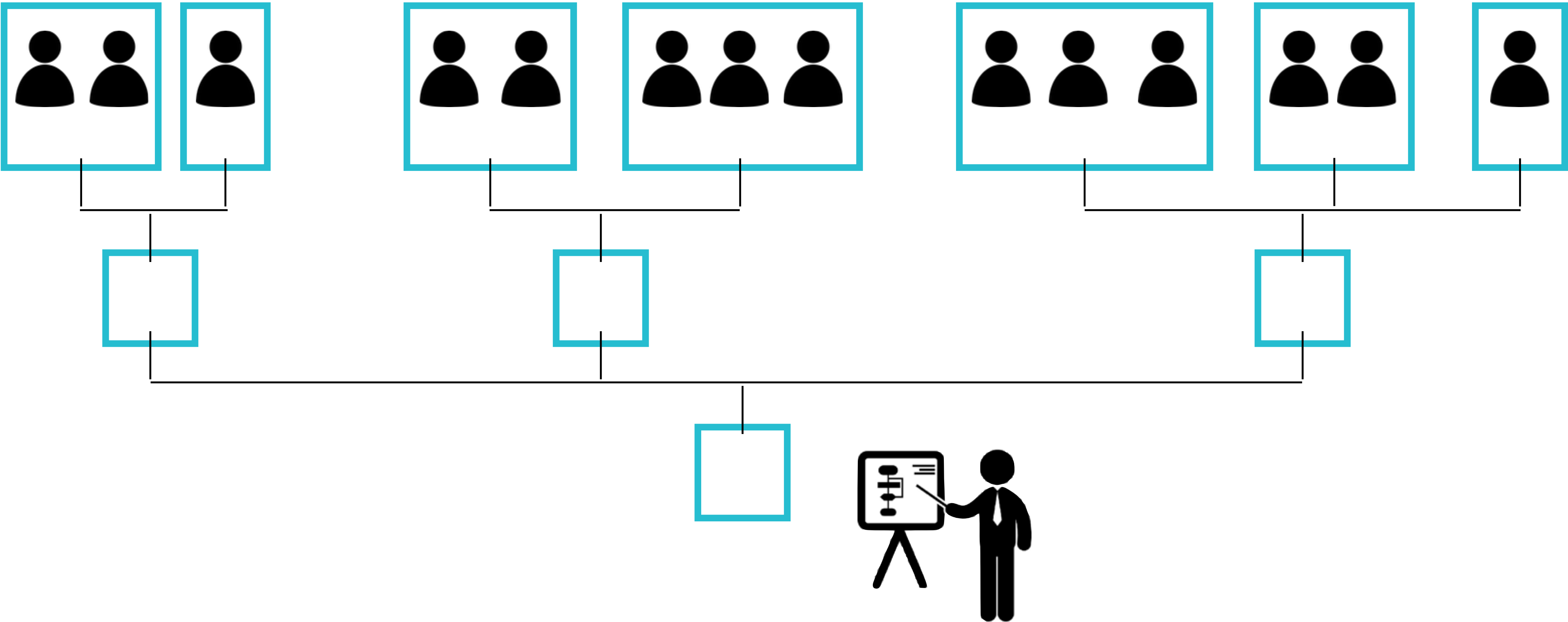## Firmware

Messaging Platform

Services

Business Analysis

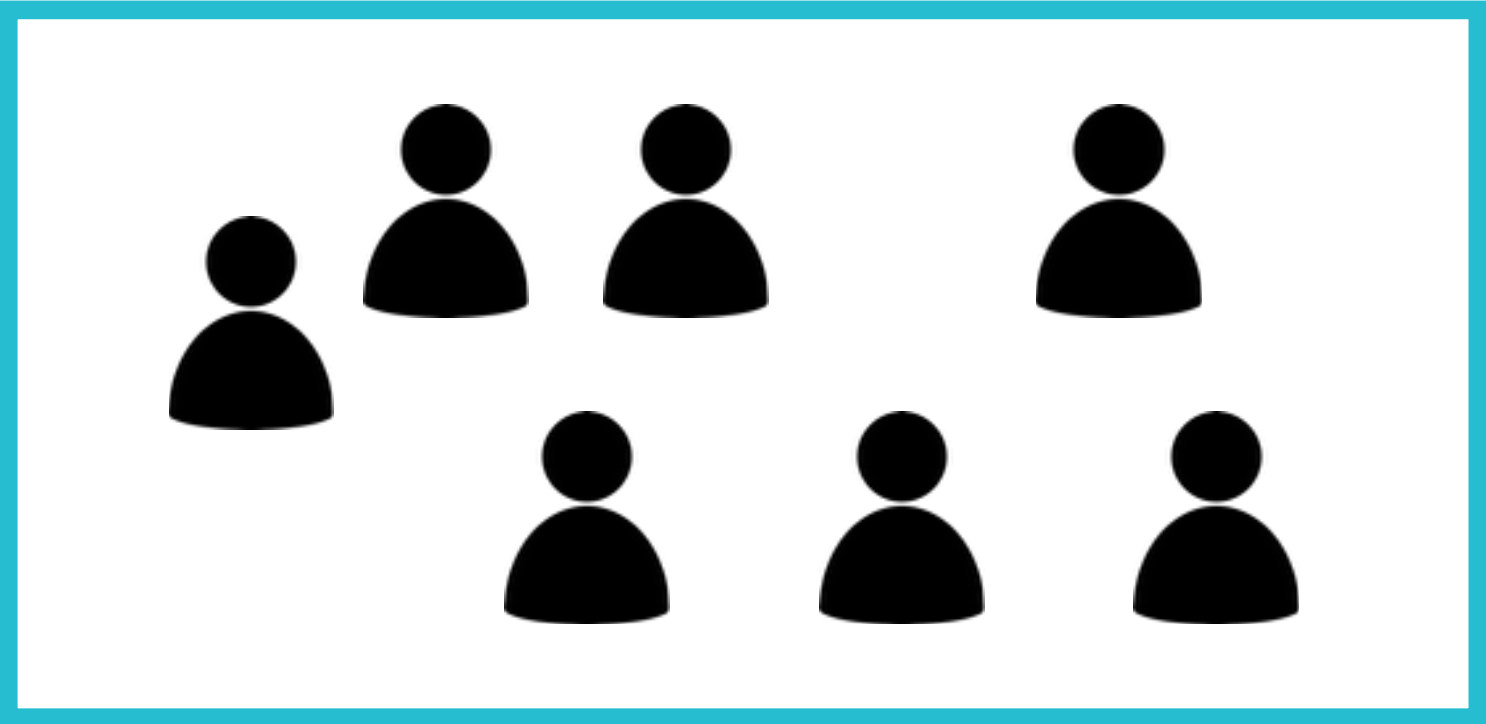Hardware Connectivity Infrastructure Apps User Research

Firmware Messaging Platform Services Business Analysis

Hardware

Firmware

Connectivity

Messaging Platform

Infrastructure

Services

Apps

Business Analysis

User Research

Experience Design

Project Management

Firmware Development

Business Analysis   Quality Assurance

Hardware Design

Development   Operations

EXPERIENCE DESIGN

Building Smart Ecosystems

UI DESIGN

Beyond the screen

INDUSTRIAL DESIGN

INTERUSABILITY

Latency

Hide technology

Offline

ARCHITECTURE

Building Smart Ecosystems

PLATFORM ENVY

DEVICE

DEVICE

DEVICE

DEVICE

REGISTRATION

AUTHENTICATION

BROKER

QUEUE

RULES ENGINE

SERVICE

SERVICE

SERVICE

SERVICE

APP

APP

APP

DEVICE

DEVICE

DEVICE

DEVICE

REGISTRATION
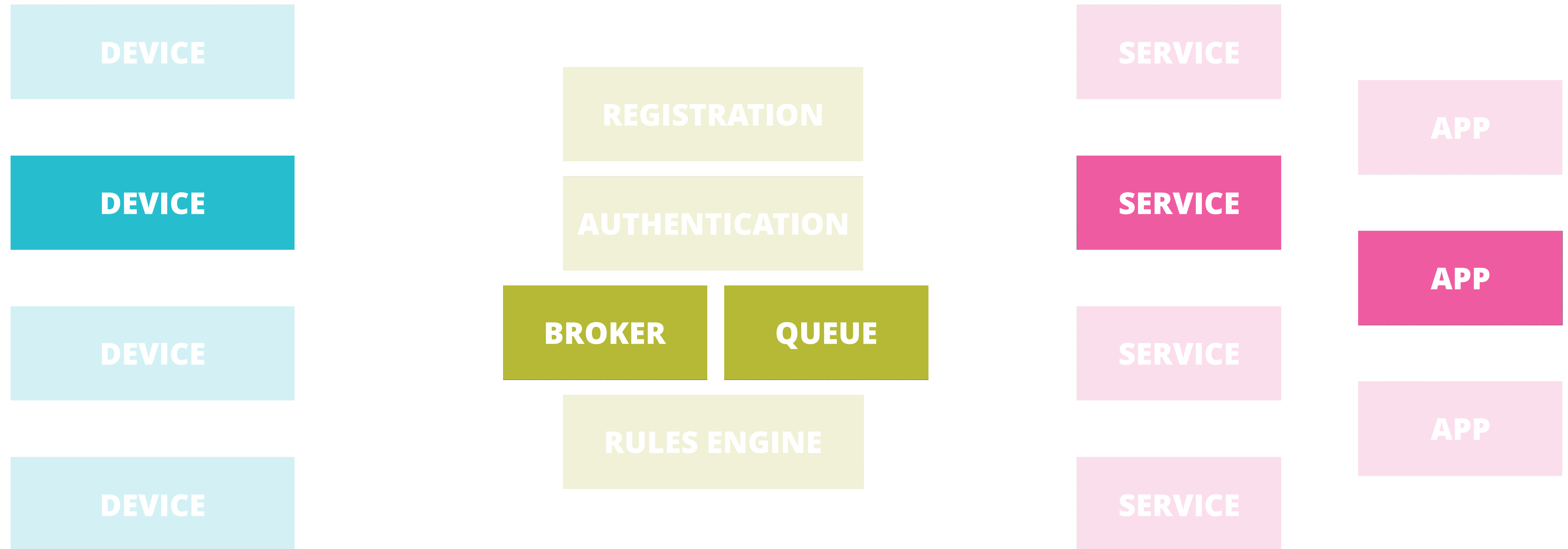
AUTHENTICATION

BROKER   QUEUE
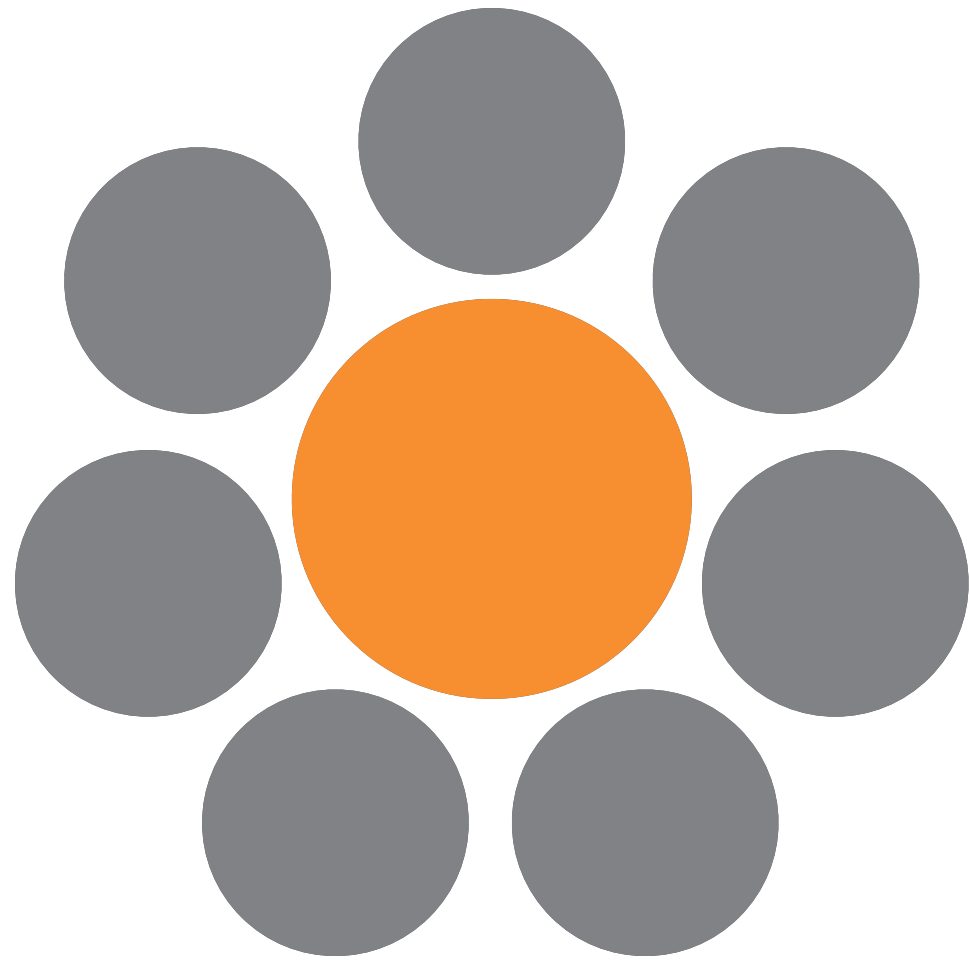
RULES ENGINE

SERVICE

SERVICE

SERVICE

SERVICE
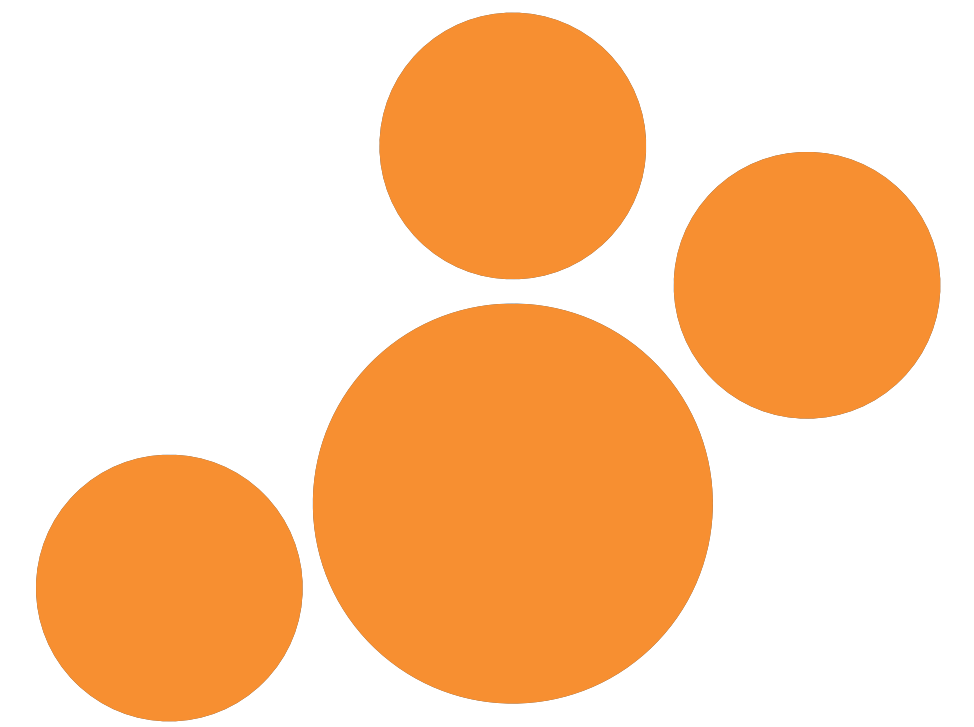
APP

APP

APP

WALKING SKELETON

Platform

Participant
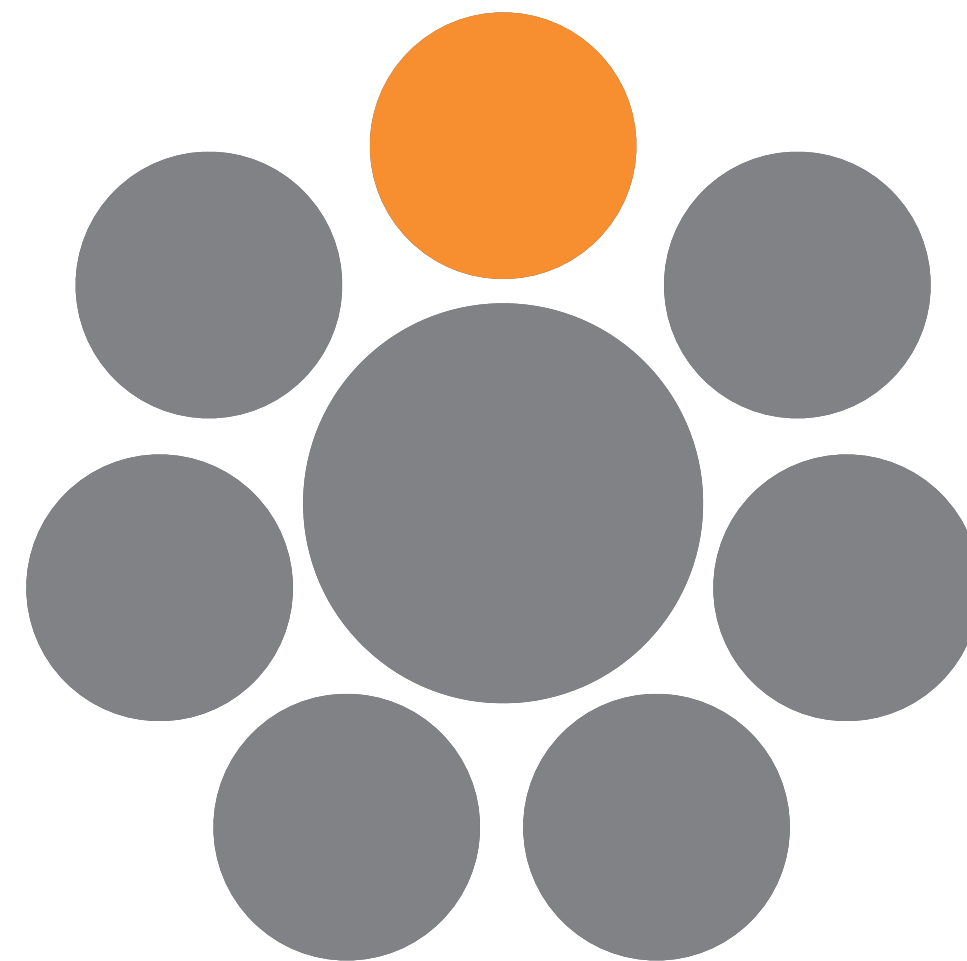
Vendor
Lock-In

DEVELOPMENT

Building Smart Ecosystems

EMBEDDED SYSTEMS

INFORMATION SYSTEMS

MOBILE SYSTEMS

⚠️ backend, frontend, mobile, cloud, ops, ml, cv, ar/vr, pcb design, embedded, 3d printing…

Frontend
Backend

Full Stack

?
?
?

2005   2015   2025

TESTING

Building Smart Ecosystems

Limited Tools for TDD

Complex scenario setup

Multiple Teams

Physical user interaction

Fake Components

Easier to setup a scenarios

Imitate user interactions

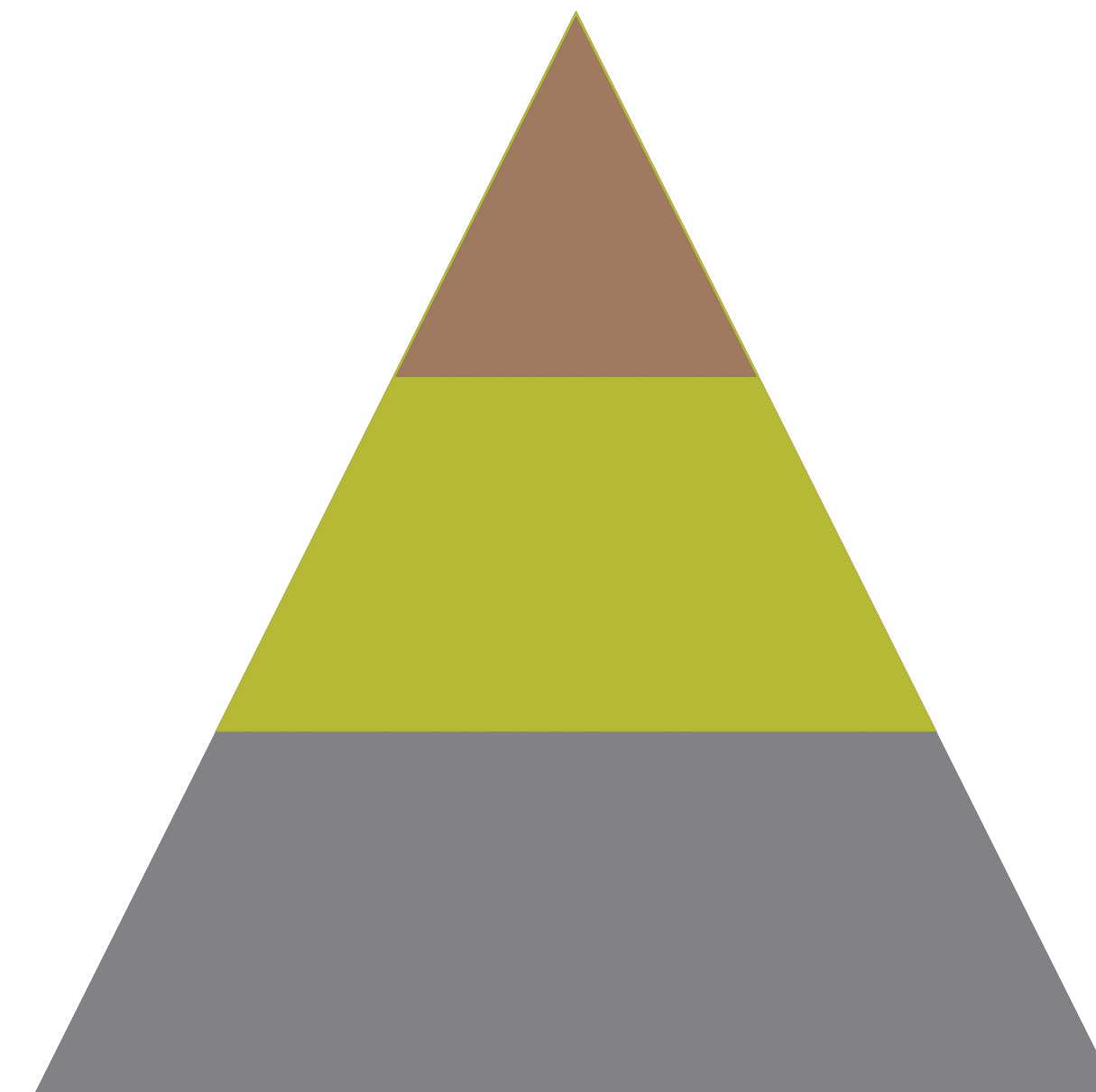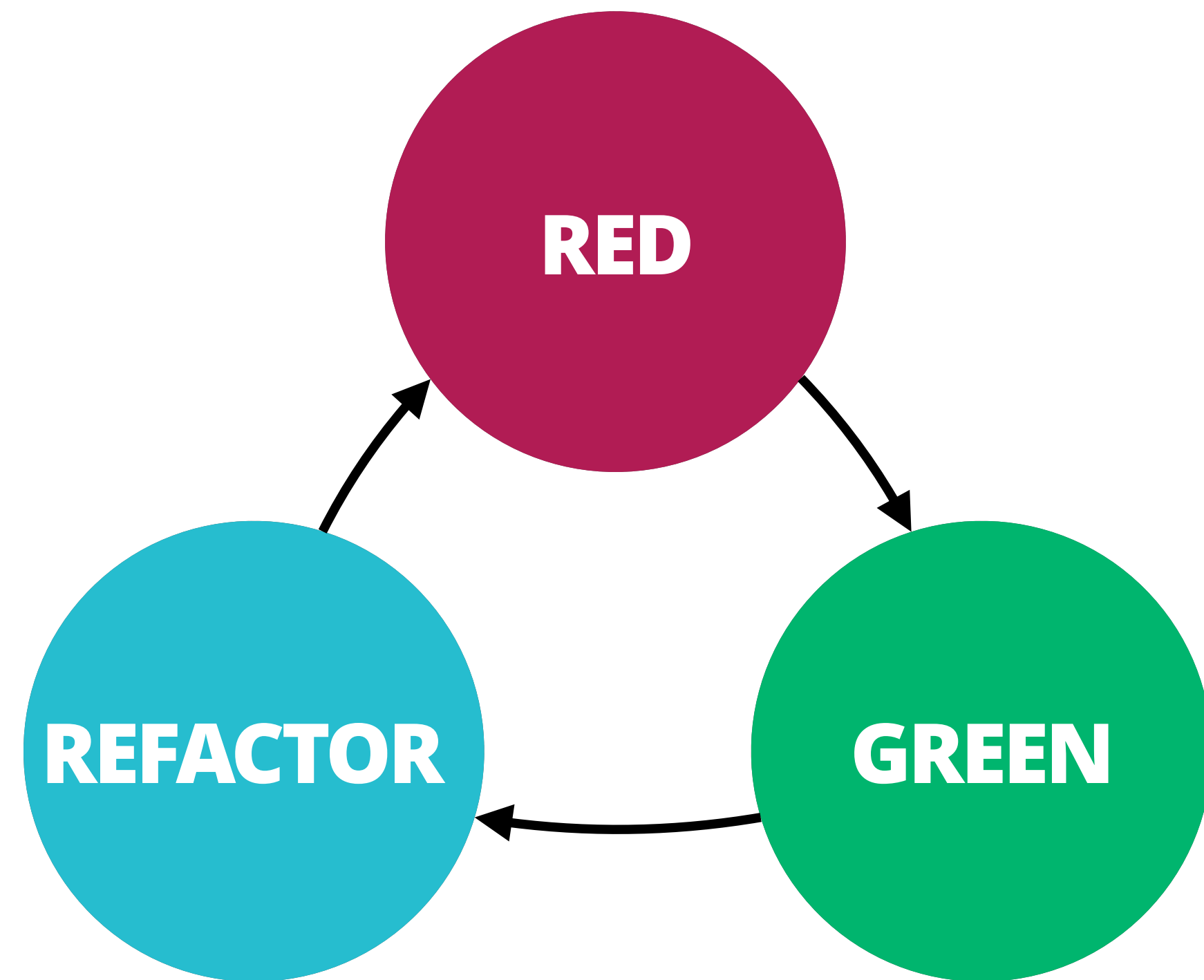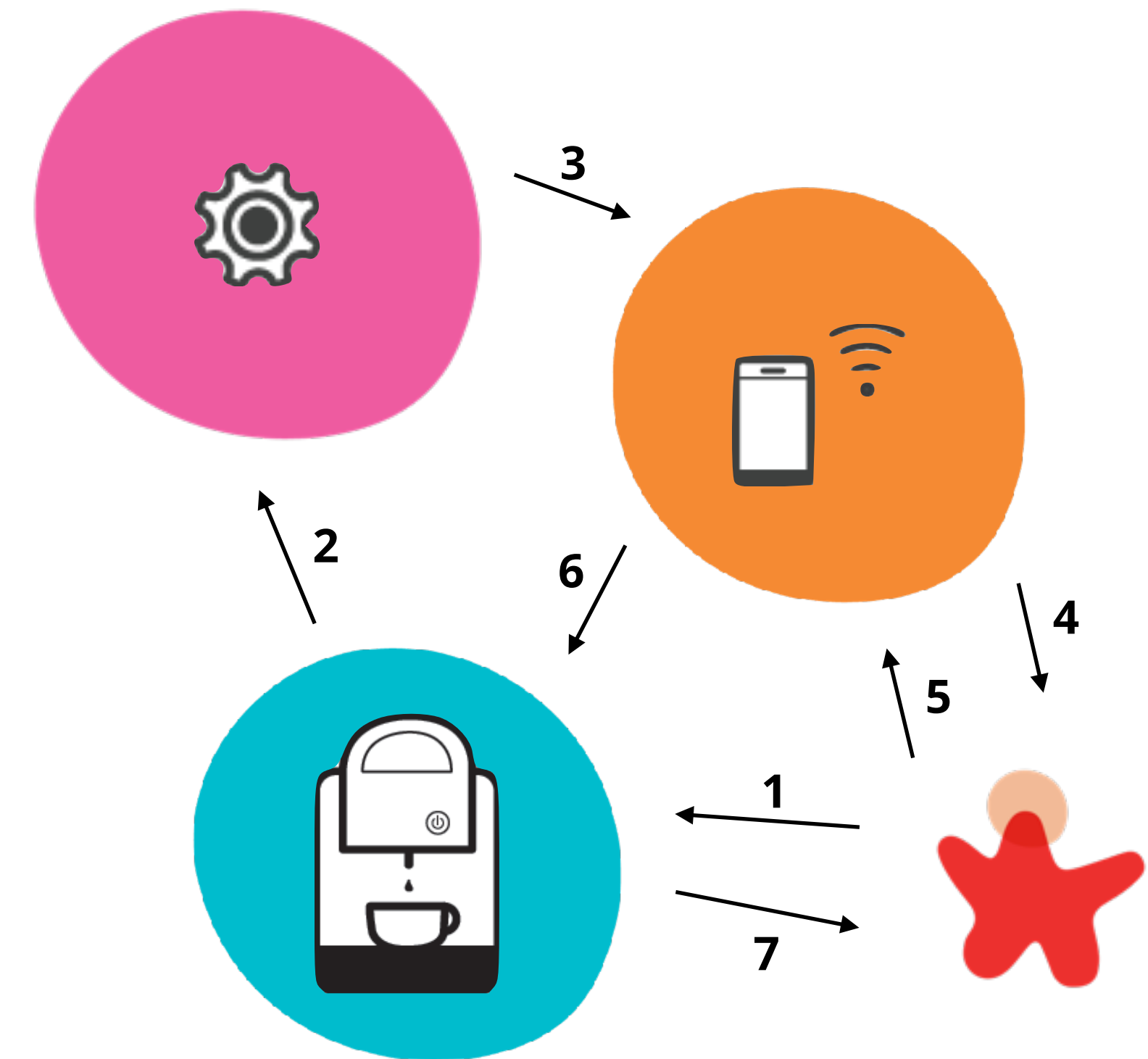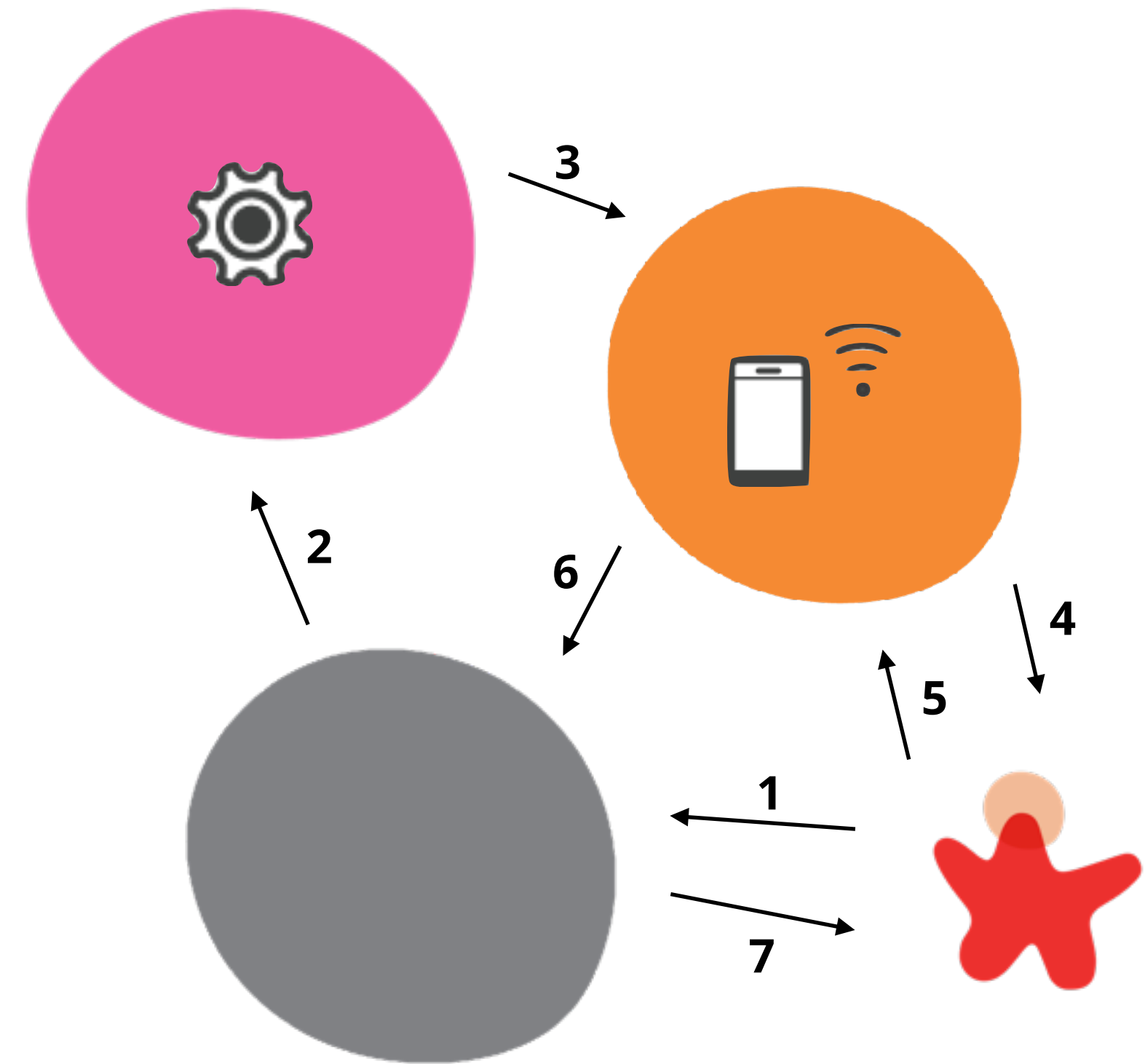# Contract Tests

Living Documentation

Automatically test updates

Fake Components

Contract Testing

Push for more automation

SECURITY

Building Smart Ecosystems

Cloud Web Interface

Privacy

Local Data Storage

Third-party backend APIs

Authentication

Authorisation

Administrative Interface

Web interface

Network Services

Mobile Application

Network Traffic

 INFORMATION SYSTEMS

 MOBILE SYSTEMS

 EMBEDDED SYSTEMS

Physical Interfaces

Memory

Firmware

Update Mechanism

Hardware Sensors

Vendor backend APIs

Ecosystem Access Control

Ecosystem Communication

THREAT ANALYSIS

No update in 10 years

*No one cares about updates
as long as it works*

*Implement automatic and secure
over the air updates... NOW!*

*don't forget the basics
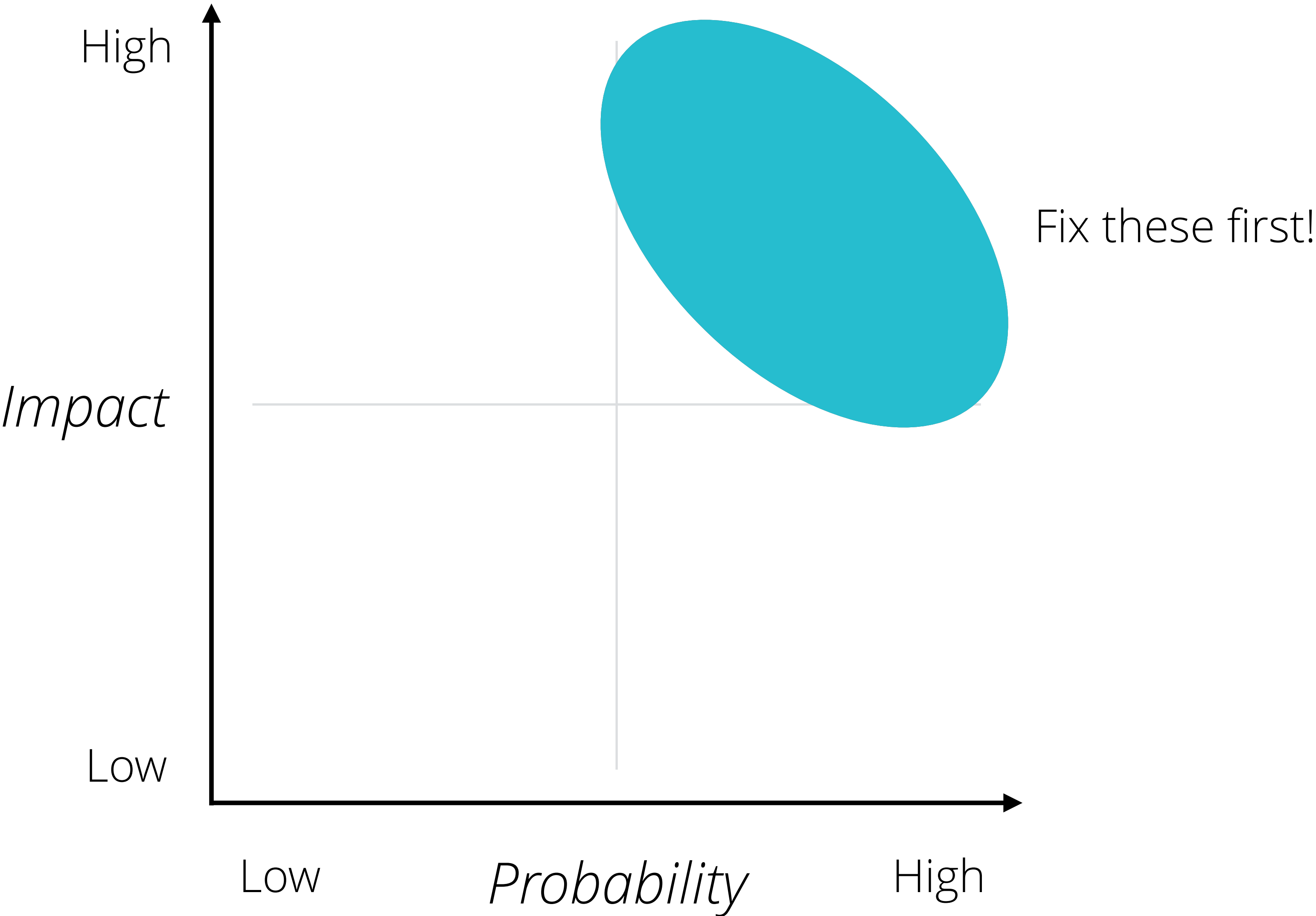Signatures
Key rotation
Secure connections
No hard coded secrets!*

PRIVACY

Building Smart Ecosystems

PRIVACY = TRANSPARENCY + CONTROL

You may refuse to provide us with some or all of your personal information, howeve
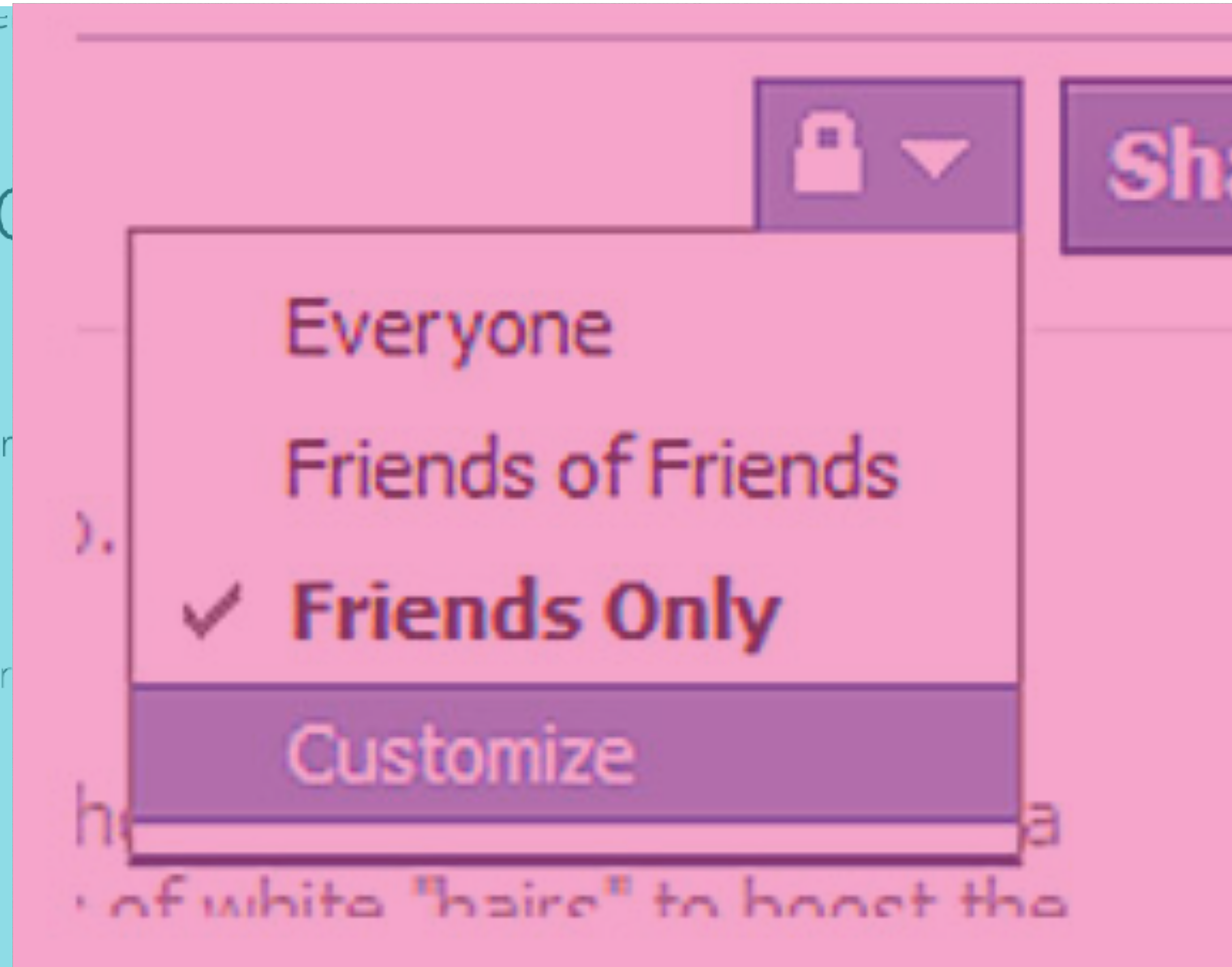we can interact with you, including providing you with our services.

C) The kinds of information we c

We usually collect the following kinds of personal information:

- Name, address, occupation, and contact information (if it is for IT project resear
  the information upon your request if it is practical to do so);
- Interests in our services or events, or that of our clients;
- Information about people's dealings with us or our clients; and
- Your opinion or comments on certain matters (e.g., process, systems and IT ser

D) How information is collected

ThoughtWorks gathers information in two ways:

Sh

Everyone

Friends of Friends

✓ **Friends Only**

Customize

Business Models

Org Structure

Experience Design

Privacy

Smart Ecosystem

Architecture

Development

Security

Testing

ThoughtWorks®

THANK YOU! DANKE! TACK!

Michael Fait - @mfait