Internet of Food

When Food Gets Networked, Life Changes

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Basics

- 9 Billion people need to be fed
- The next 40 years we must produce as much food as in history of man
- In a sustainable way
- The food needs to be healthy
- Otherwise our health budgets will explode

What does the food sector produce?

- Greenhouse gas
- Antibiotics resistence
- Obesity
- Food induced mortal poisoning
- Counterfeit food products
- Massive amounts of waste
- Loads of marketing
- Sometimes even food

Framework Vision

- To construct a framework to be used for structuring the discussion around Internet and food, thereby furthering the discussion around how to facilitate openness and innovation in the field of food with the goal to feed the planet in a healthy and sustainable way

Modus operandi

- Step 1: Share the overall framework with basic descriptions to the board and select advisors, then push to the list for open discussion
- Step 2: Make the various posts of the framework subject to discussion
- In each case, questions and comments are included in a continuous feedback loop until general consent settles the framework and individual parts of the framework

Framework Structure

- Identify topcial areas for dialogue and discussion
- Identify necessary infrastructure and data – the internet of food framework
- Identify existing standards and infrastructure within the suggested framework
- Identify areas in need of standardization
- Point to potential solutions for standardization
- Identify ways of connecting un-connected infrastructure and data
- Identify interfaces between standards

Initial Areas of Discussion

- Is it one system or two?
  - Production/distribution
  - Content/information
- Decide on possible limitation of the project scope
- Can the former be handled through amendments to current IoT protocols for sensors, machine instructions etc?

Initial Areas of Discussion – Food Security

- Food security
  - Hacking food systems
  - Food weapons/terrorism (delayed effects)
  - Sensor intelligence
  - Dispenser control
  - Additives
  - Health effects
  - Oligopoly regarding tech (Google-like dominance)

INITIAL FRAMEWORK

Framework Modules

- Addressing
- Metadata
- Data – data structures
- Access
- Trust/signing/verification/validation

Operations

- Search for location
- Lookup data
- Collect and update data and metadata (crowd, db, crawl, spindle, sensors)
- Identify connections between data, standards
- Relate access control/signing/verification/ trust to various actions/records/attributes

Addressing

- What would an addressing standard for Internet of Food need to contain?
- Are there existing addressing standards that can be used for Internet of Food?
- Are there existing addressing systems that can be tweaked for Internet of Food
- Are they accessible, usable without building monoliths, silos or central dependencies?

Metadata

- Is there an existing metadata description covering all aspects of food or are there many metadata descriptions? Missing areas?
- Do these existing descriptions follow a global standard (existing or de facto)?
- Could these descriptive standards be unified into one metadata standard suitable for digital distribution?
- Which fields/field types would need to exist in the metadata standards in order to make for a digitally functioning metadata standard?
- Common file/publishing format?
- Once upon a time, Dublin Core...still?

Data

- Is there an existing data structure for food or are there many?
- Existing and missing areas?
- Do these existing data structures follow a global standard (existing or de facto)?
- Could these existing data structures be unified into one standard suitable for digital distribution?
- Which fields/field types would need to exist in the data standards in order to make for a digitally functioning data standard?
- Common file/publishing format?

Access

- How to construct a structure that allows for both public and closed information publishing (not all data is available to everyone)?
- How to integrate with the plethora of information access control systems?

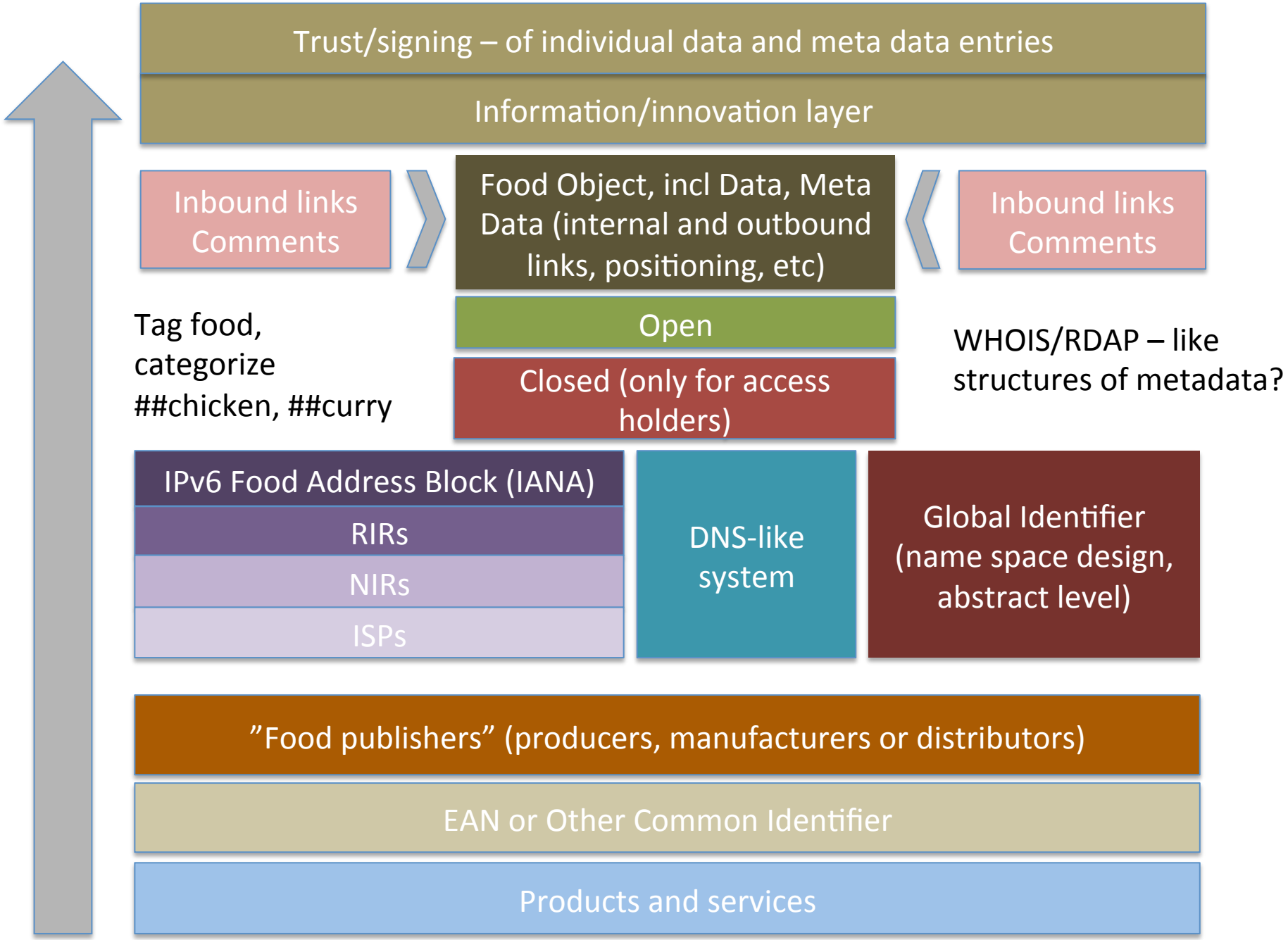
Trust/signing/verification

- Trust contains various aspects such as product information, product relations (other products from the same manufacturer, etc.), position, chain of positions, detection of fraud and/or manipulation
- Official verification and validation
- Endorsements/crowd annotation
- Digital signatures

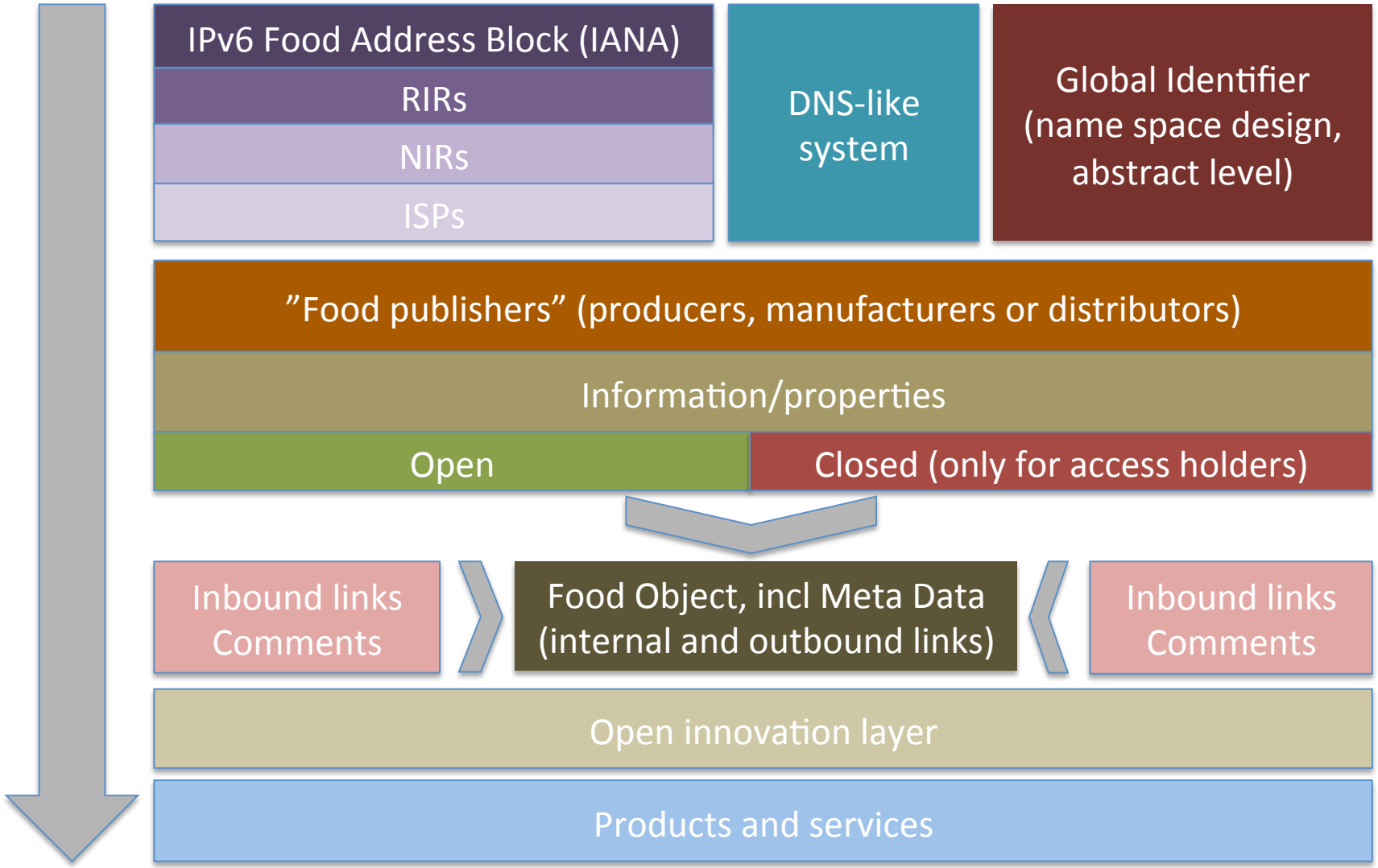
NAMING STANDARD
– ELABORATION

Naming Standard

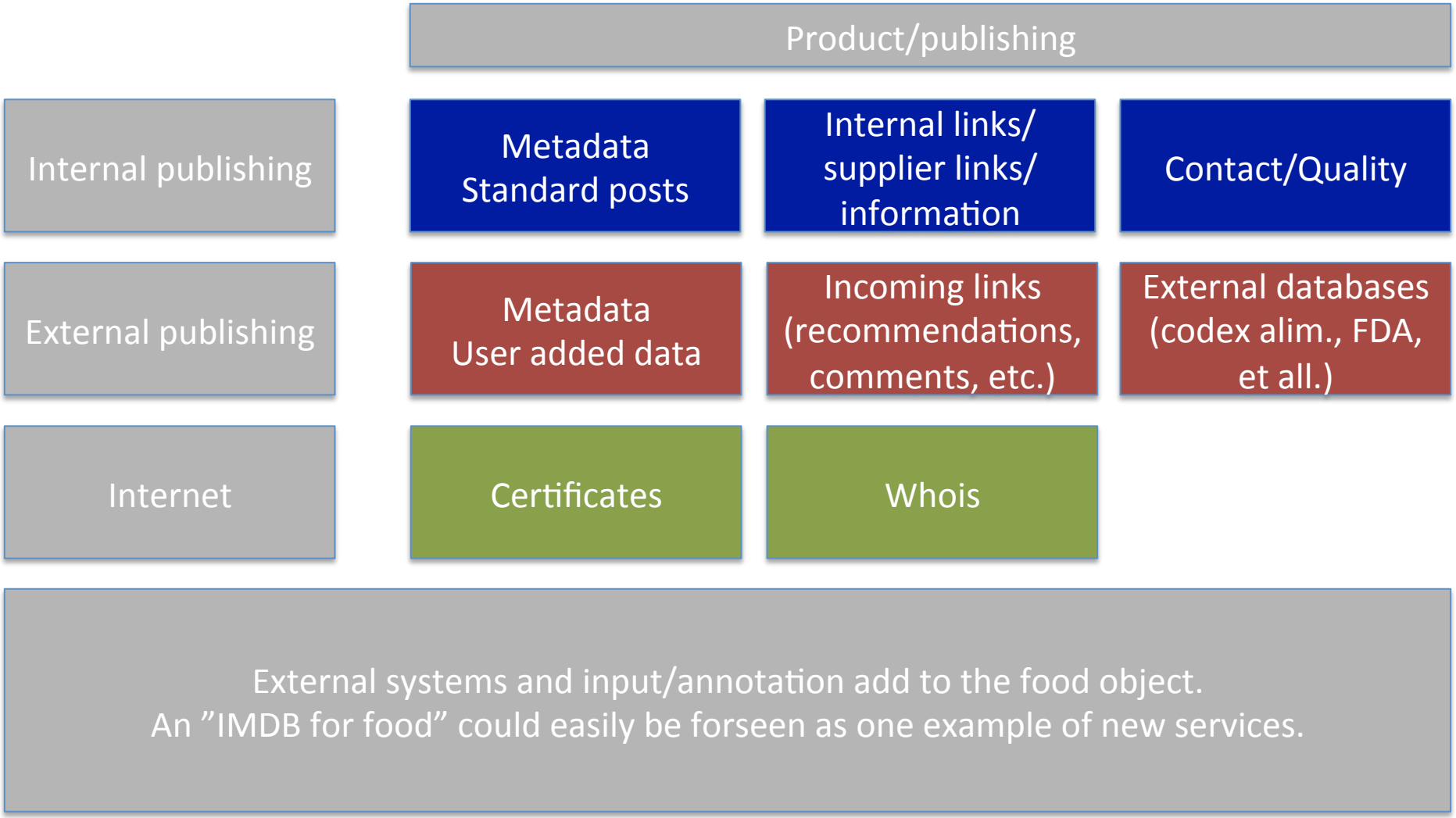
- There probably needs to be a specific naming standard for food in the Internet space
- How does the naming standard for IoT work?
- Both current domain name system and IPv6 have capacity to handle the issue
- Other and better solutions might however emerge from the discussion
- Final decision left for later...


Trust/signing – of individual data and meta data entries
Information/innovation layer
Inbound links Comments
Food Object, incl Data, Meta Data (internal and outbound links, positioning, etc)
Inbound links Comments
Tag food, categorize ##chicken, ##curry
Open
Closed (only for access holders)
WHOIS/RDAP – like structures of metadata?
IPv6 Food Address Block (IANA)
RIRs
NIRs
ISPs
DNS-like system
Global Identifier (name space design, abstract level)
”Food publishers” (producers, manufacturers or distributors)
EAN or Other Common Identifier
Products and services

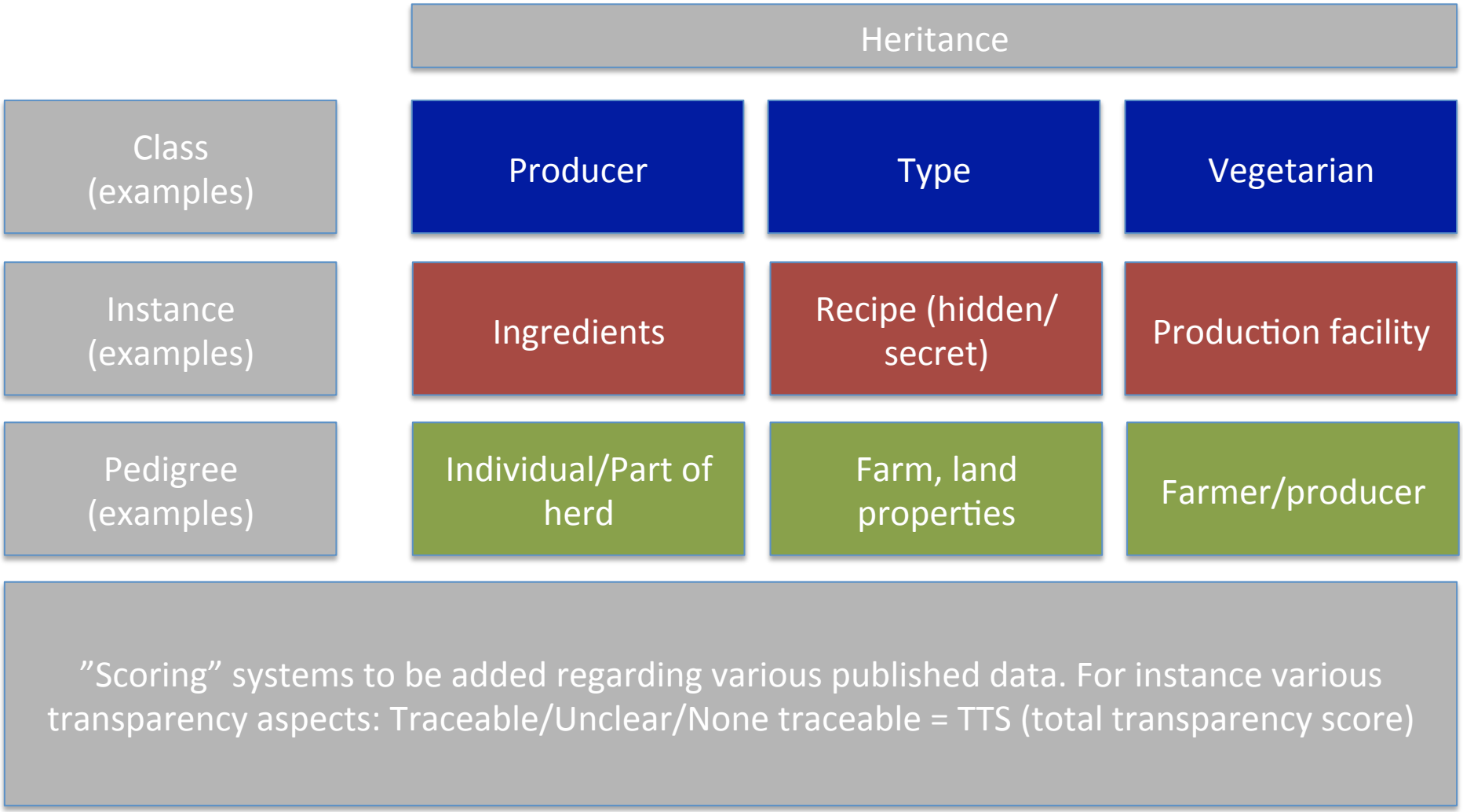
Tentative Structure



Tentative Structure



Tentative Structure (cont.)



POLICY

Policy

- Policy
- Policy vs standard
- How to include already existing projects within IoF
- Openness between projects
- Limitation of the IoF project
- Authentication (read/write/validate)
- Auctorization (policy)
- Rights to conduct an operation

Philiosophy of Openness

- Open data
- Open positioning
- Writeable meta data fields (wiki)
- Open trust
- Open food
- Wide usage of GPL and CC
- Connection with other areas (Quantified self, food, ”shit”)

The Use of Categories

- The value of a quick and dirty grassroots solution for connecting food with the internet as opposed to a more structured approach
- Could there in such case be a categorizing framework for food for usage at the information source and that could hook into already existing infrastructure such as search?
- ##Vina Albali, ##Red Wine, ##Merlot/Pinot Noir. Big data could be used for sorting tags and making connections
- Tag shortener – like Bitly, could be put on food and visualized by app
- Is there a common tag structure/method that can be published and added into publishing systems, Wp, etc.
- This could make for a quick uptake amongst new food and tech companies
- Difficulties vs older food companies and ther standards?
- RFC for a Common Descriptive Food Category Format: CDFCF?
- Who to engage in such case?
- A list of ##-tags published at Internet-of-food.org?

To Consider

- The complexity of combined food products
- Mobility
- Big Data
- Best Practices/”Quantified Food Handling”
- Tech – hygiene factor in the food sector
- Environmental control (sensors – open reporting)
- Instructions to machines/systems (multicast instructions?)
- Layer of security/access/identity
- Mesh nets through farm animals? (sensors)
- IPv6 deployment as factor for improved food competitiveness
- After market (health care/health effects, QF, follow-up)
- New business models from breaking up structures
- Self configuring sensor nets
- Edible sensors