Personal Health Navigator
Discussion at HL7
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Send comments or suggestions to:

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What is Health?

Constitution

Credits   +

WHO remains firmly committed to the principles set out in the preamble to the Constitution

- Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

- The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition.

- The health of all peoples is fundamental to the attainment of peace and security and is dependent on the fullest co-operation of individuals and States.

- The achievement of any State in the promotion and protection of health is of value to all.

- Unequal development in different countries in the promotion of health and control of diseases, especially communicable disease, is a common danger.

- Healthy development of the child is of basic importance; the ability to live harmoniously in a changing total environment is essential to such development.
- The extension to all peoples of the benefits of medical, psychological and related knowledge is essential to the fullest attainment of health.

- Informed opinion and active co-operation on the part of the public are of the utmost importance in the improvement of the health of the people.

- Governments have a responsibility for the health of their peoples which can be fulfilled only by the provision of adequate health and social measures.

Constitution of the World Health Organization

The Constitution was adopted by the International Health Conference held in New York from 19 June to 22 July 1946, signed on 22 July 1946 by the representatives of 61
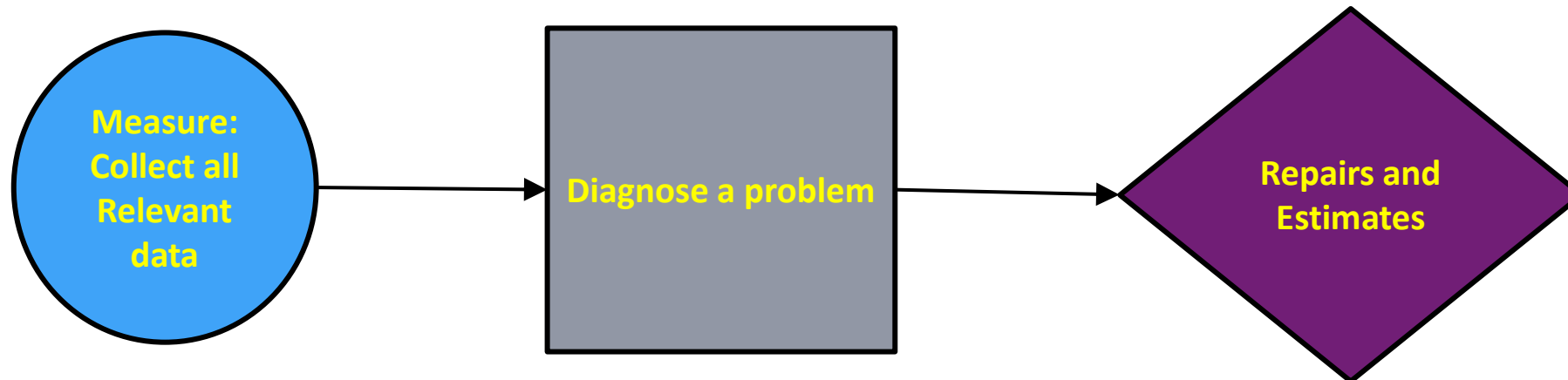
Health

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How can we care for Health?

- When I face a problem, go to a repair shop.

- Consider it a journey with aspirational goals and use perpetual navigational tools.

Repair Model

When I face a problem, I go to a repair shop.

Measure: Collect all Relevant data → **Diagnose a problem** → **Repairs and Estimates**

Current Healthcare: Health Repair Model

Measure
Collect all
Relevant data

Which Disease?

Prescription

- No estimates.

- No guarantees.

- Healthcare is critical for life so 'Repair people' could get away with it.

- Healthcare and medicine evolved to be 'repair' and dominates this model.

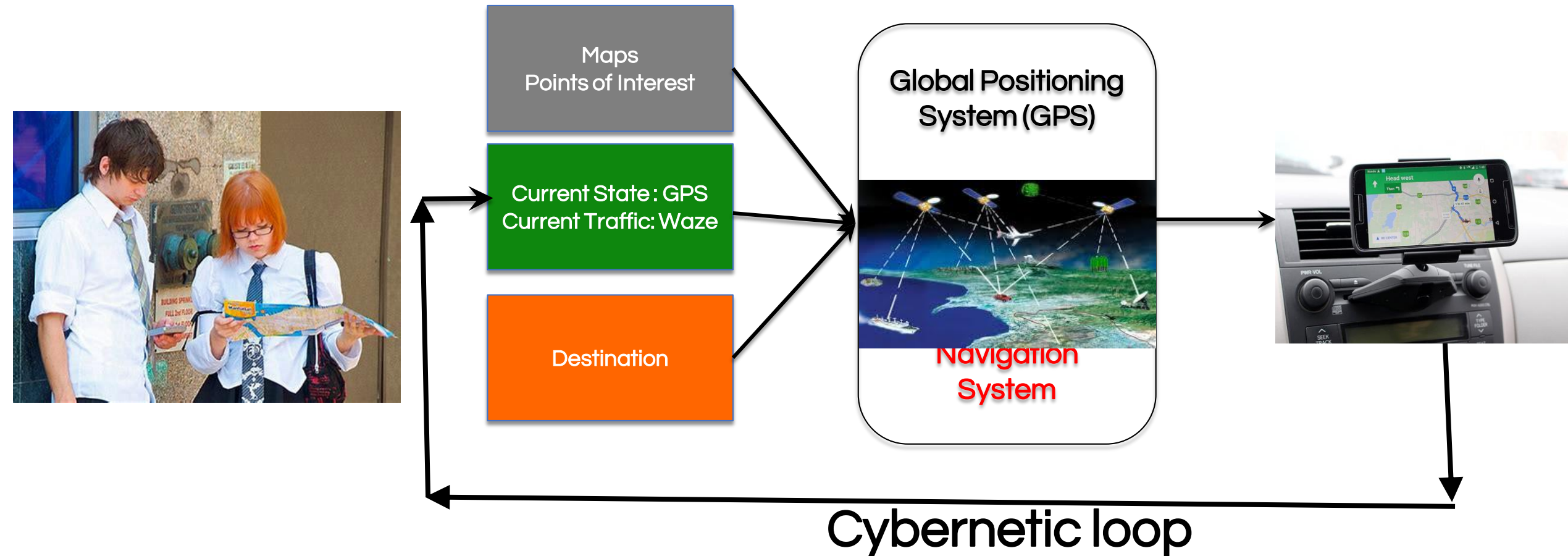## Healthcare = Repair Model - (cost estimates + Guarantees)

Navigation

Navigation: The process or activity of accurately ascertaining one's position and planning and following a route.
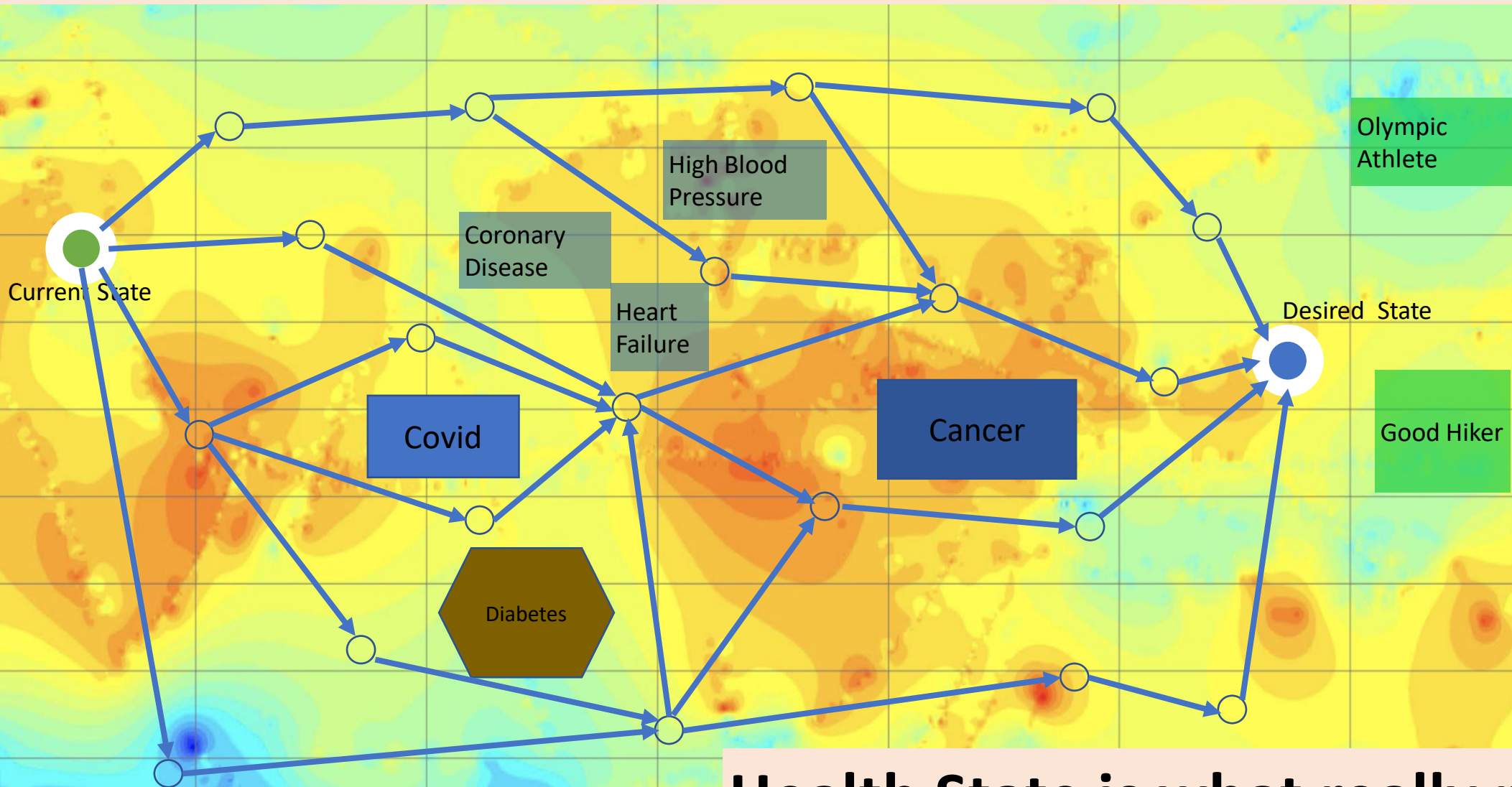
Consider health a journey with aspirational goals and use perpetual navigational tools.

Health is Navigation in a Multidimensional Space

Olympic Athlete

High Blood Pressure

Coronary Disease

Heart Failure

Current State

Desired State

Covid

Cancer

Good Hiker

Diabetes

Health State is what really matters.
Health is a high-dimensional space.

Personal Health Navigator

1. Personalization
2. Holistic Perspective
3. Proactive and Preventive
4. Data Integration and Analysis
5. Patient Empowerment and Engagement
6. Continuous monitoring and adaptation

Healthcare systems   Vs.   Health care.

- **Disease based**
- **Episodic Care**
- **Population based**
- **Symptom management**
- **Selective data management**

- **Health State**
- **Perpetual observations and care**
- **Personalized using Personal model**
- **Holistic care**
- **Multimodal dense longitudinal data management for personal model and health state estimation**

Can Health Use a Navigation **Model**
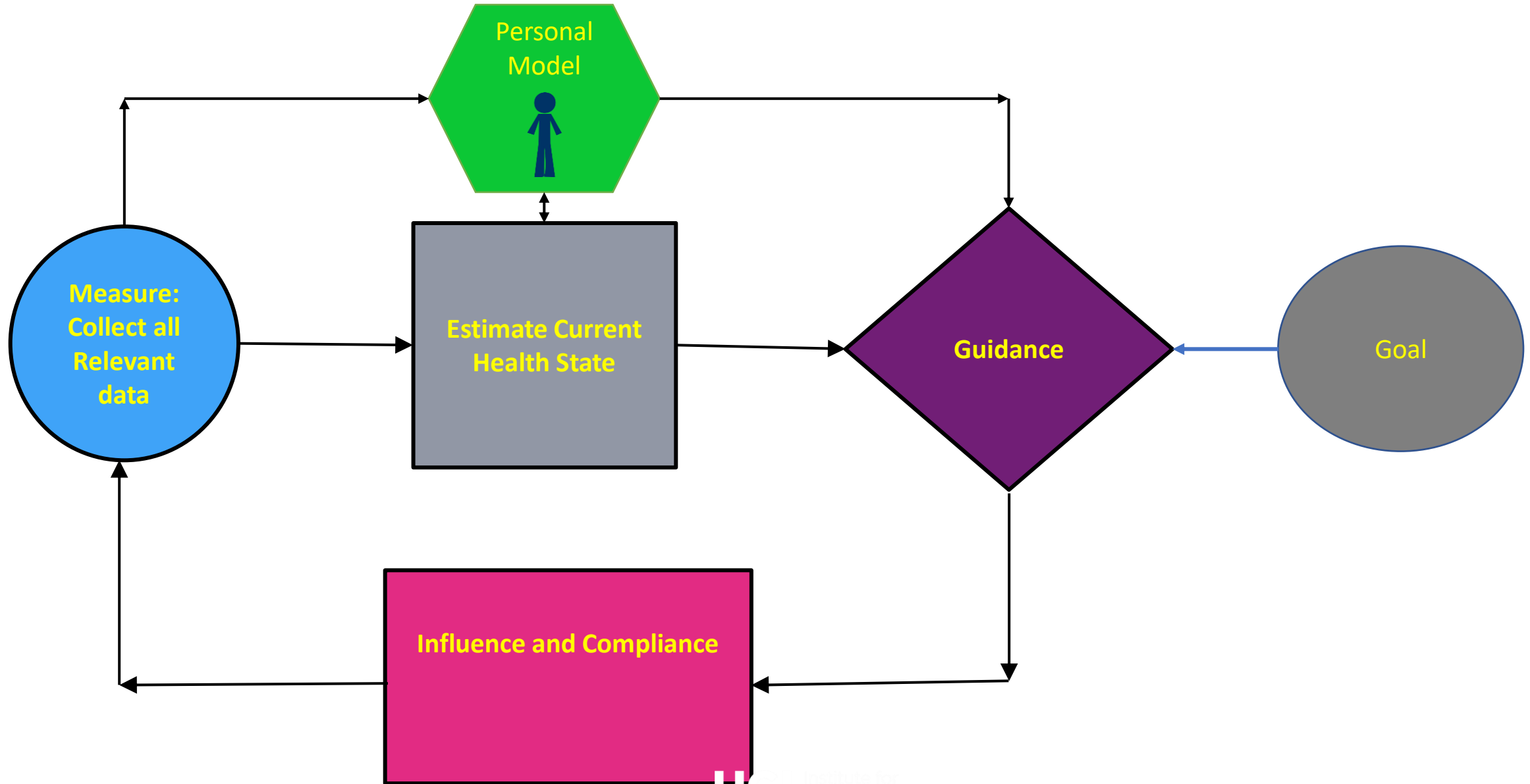
Goal Setting

- Set in common language. Translated to system's internal states.

- Different applications may use different states. Some could be very simple like weight or A1C. Others could have multidimensional state vector.

- Desired state space depends on many factors and should be considered by applications.

Measurements/Observations

- Many different types of measurements:
  - Low cost, non-intrusive, perpetual
  - High cost, intrusive, diagnostic
  - Reports and EMAs
- Synchronization
- Analytics
- Multimodal/multimedia computing

- Application determines what are inputs and outputs.

Estimation of Health State

- Application determines health states.

- Application determines what is input to the system.

- Personal model plays important role in determination of health states.

- Multimodal estimation techniques may be used in estimation of states

Guidance

- This is a context sensitive recommendation engine:
  - Personal Model
  - Context of the person, environment, regulations
  - Potential actions: lifestyle, environment, medicine, ,,,
- Very strong Knowledge Base required.
- One decision vs routing

Influence and Adherence

- Follow up by the user.

- Behavior change is the most difficult aspect of health navigation.

- Different things work for different people.

- Close-loop perpetual system is very helpful.

Navigation Model
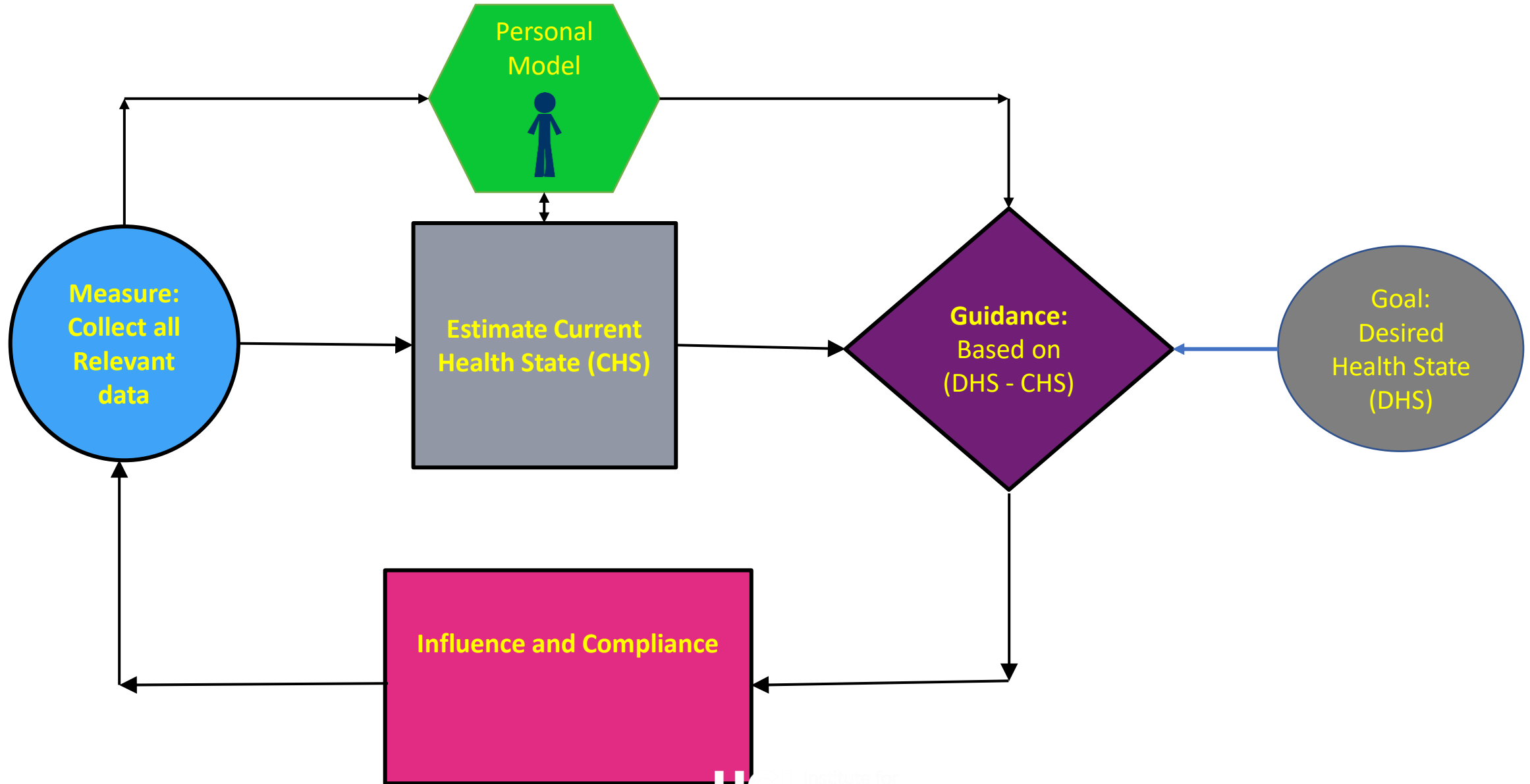
Personal Models

- Each person is unique.
- Same thing affects people differently.
- Different body, different likes, different social/religious practices.

- Current health practices based on population models – which presents difficulties.
- Building precise dynamic personal models is important.

Personal Chronicle, aka Personicle

- Preventive, predictive, and personal are closely intertwined.

- Personal Models require dynamic longitudinal personal data.

- Personicle is an effort to create an infrastructure to collect such data from all possible sources.

- An open-source effort to build this is underway.

- To make it usable by people, events are more important than just data.

Event Mining

- Causality relates events.

- An observed output event may be result of several past events including states and inputs.

- Event mining finds causality for building Personal Models.

- Using Personicle data, one may use event mining to build Personal Models.

Some Common Components of a Personal Health Navigator
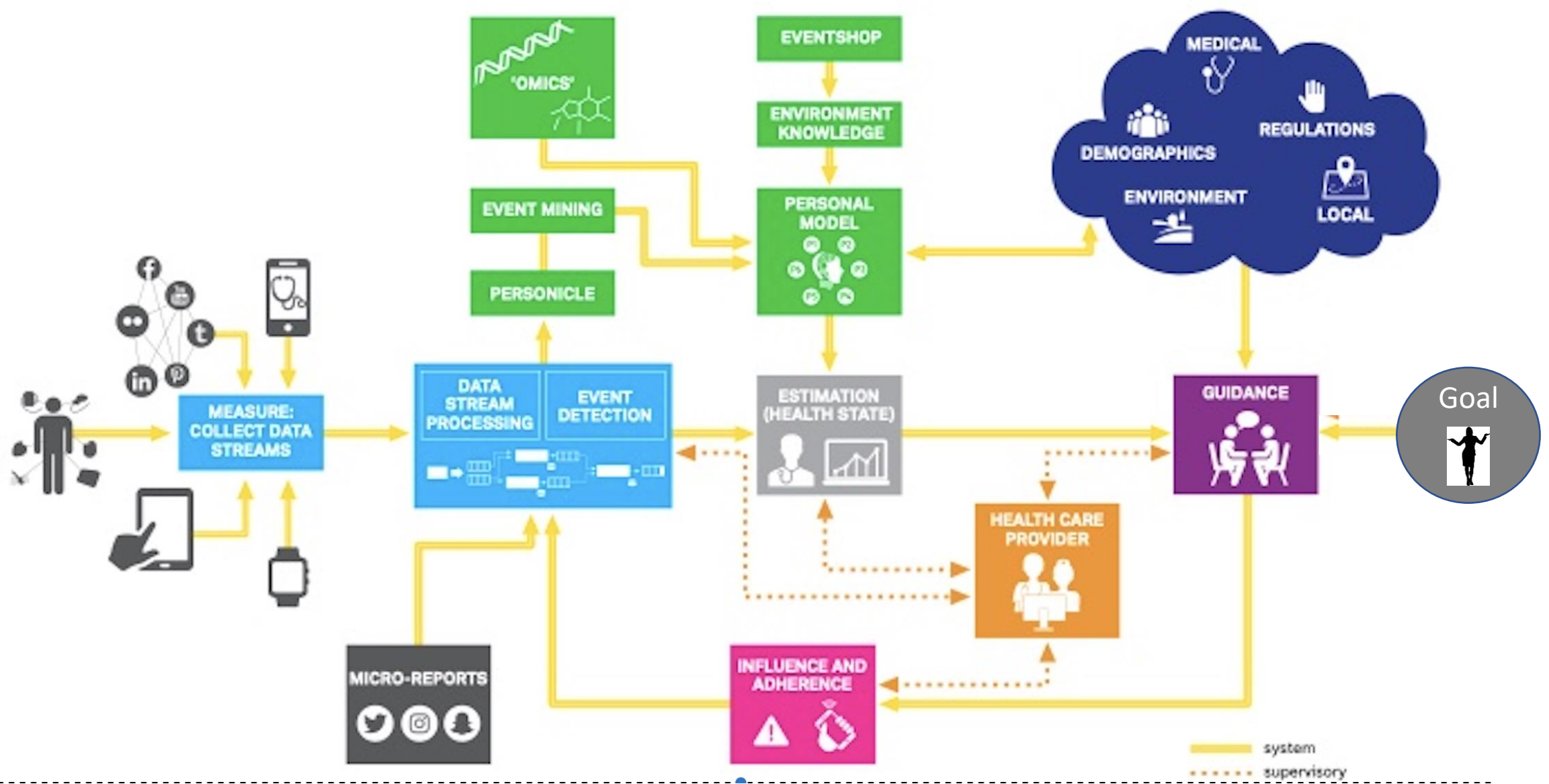
HL7 and PHN

- Aligned Vision:

  "A world in which everyone can securely access and use the right health data when and where they need it."

- Shared Goals:
  - Data Integration
  - Promoting Patient Engagement
  - Overall better health outcomes – more compete model of a patient
  - PHN requires interoperability among many health components

- Relevance and Synergy
  - HL7's expertise in healthcare interoperability will benefit PHN
  - HL7 standards can facilitate PHN-based solutions
  - Integration of EHR and UGHD will improve healthcare effectiveness
  - Close collaboration & coordination with other SDOs, including
    ISO/TC215 for 9472 PHN standards family

- HL7 provides a **home** for a *robust standards-based implementation community*

THANKS.