Dynamic Disease Reporter

Performance Measure: Curtail the spread of highly contagious, serious diseases. Provide appropriate treatment guidelines.

Environment: World Health Organization and health clinics throughout the world. The clinics vary greatly in terms of the resources available to detect and to report disease, as well as in terms of personnel, equipment, and medicines available to treat disease.

Actuators:

Correlate reports: Search for patterns in the disease reports.

Identify epidemics: When the cumulative reports from a region match one of the recognized patterns in terms of number of cases of a disease or percentage of the population affected, notify local health authorities of a significant medical event. This can be a report of a suspected epidemic, notification of a suspected epidemic in a neighboring region, or a prediction that an epidemic will likely occur.

Supply disease protocols: When an epidemic is identified, or certain diseases are reported, send health authorities in the affected areas the latest information on the detection, containment, and treatment of the disease. This information must be tailored to the particular geographic, social, and economic environment to which it is being sent.

Identify drug-resistant strains of diseases: When a pattern of drug-resistance is identified, notify health authorities.

Disease identification: When a "new" disease is reported, attempt to map it to a known disease, and report findings to the reporting agency.

Correlate reports of new diseases: When a match is made between reports from different regions of unrecognized "new" diseases, notify regional health authorities of the possible discovery of a "new" disease.

Sensors: Memos from health clinics throughout the world reporting the incidence of certain known communicable diseases, as well as the symptoms and mortality of new, unrecognized diseases. Memos contain information about the age of the victim, source of contagion, symptoms, incubation period, treatment provided, and response (or lack thereof) to treatment.

Agent-6. Consider the PEAS description of an agent that reports on communicable diseases as shown in figure 1. Determine what type of agent architecture is most appropriate (table lookup, simple reflex, goal-based, or utility-based). Give a detailed explanation and justification of your choice

Agent-7. Describe the evaluation function that might be used by the *Dynamic Disease Reporter*. Is it a static or a dynamic evaluation function?

Agent-8. Assume that you designed a utility-based agent for the *Dynamic Disease Reporter* (whether or not the problem warrants it). Describe the utility function that it might use.

Agent-9. What performance measures would you recommend for your *Dynamic Disease Reporter*?

Agent-10. Describe the properties of the environment of the *Dynamic Disease Reporter* in terms of the principal distinctions we discussed in class (accessible vs. inaccessible, deterministic vs. stochastic (or nondeterministic), episodic vs. sequential (or nonepisodic), static vs. dynamic vs. semidynamic, discrete vs. continuous). That is, *identify in detail* which properties are characteristic of the environment described, and *give a detailed justification of your description*.