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(12) **United States Patent**
Liu et al.(10) **Patent No.:** **US 8,117,233 B2**
(45) **Date of Patent:** ***Feb. 14, 2012**(54) **METHOD AND SYSTEM FOR
MESSAGE-ORIENTED SEMANTIC WEB
SERVICE COMPOSITION BASED ON
ARTIFICIAL INTELLIGENCE PLANNING**(75) Inventors: **Zhen Liu**, Tarrytown, NY (US); **Anand Ranganathan**, White Plains, NY (US);
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G06F 7/00 (2006.01)(52) **U.S. Cl.** **707/802; 707/608**(58) **Field of Classification Search** 707/999.007,
707/802, 608
See application file for complete search history.(56) **References Cited****U.S. PATENT DOCUMENTS**

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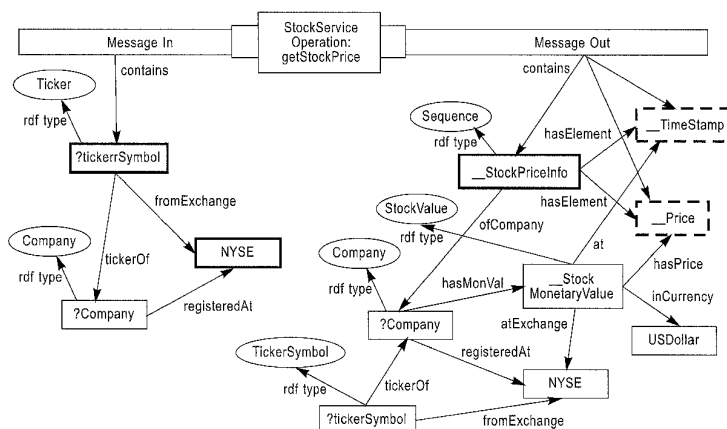
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Primary Examiner — Hung T Vy*Assistant Examiner* — Phuong Thao Cao(74) *Attorney, Agent, or Firm* — William J. Stock; F. Chau & Associates, LLC(57) **ABSTRACT**

A method for modeling a web service operation, includes: defining an input message pattern that describes input requirements of a web service operation, wherein the input message pattern includes a set of variables representing data elements that must be contained in a message input to the web service operation, and a graph pattern that semantically describes the data elements that must be contained in the message input to the web service operation; and defining an output message pattern that describes an output message of the web service operation, wherein the output message pattern includes a set of variables and exemplars that represent data elements contained in the output message, and a graph pattern that semantically describes the data elements contained in the output message.

17 Claims, 5 Drawing Sheets

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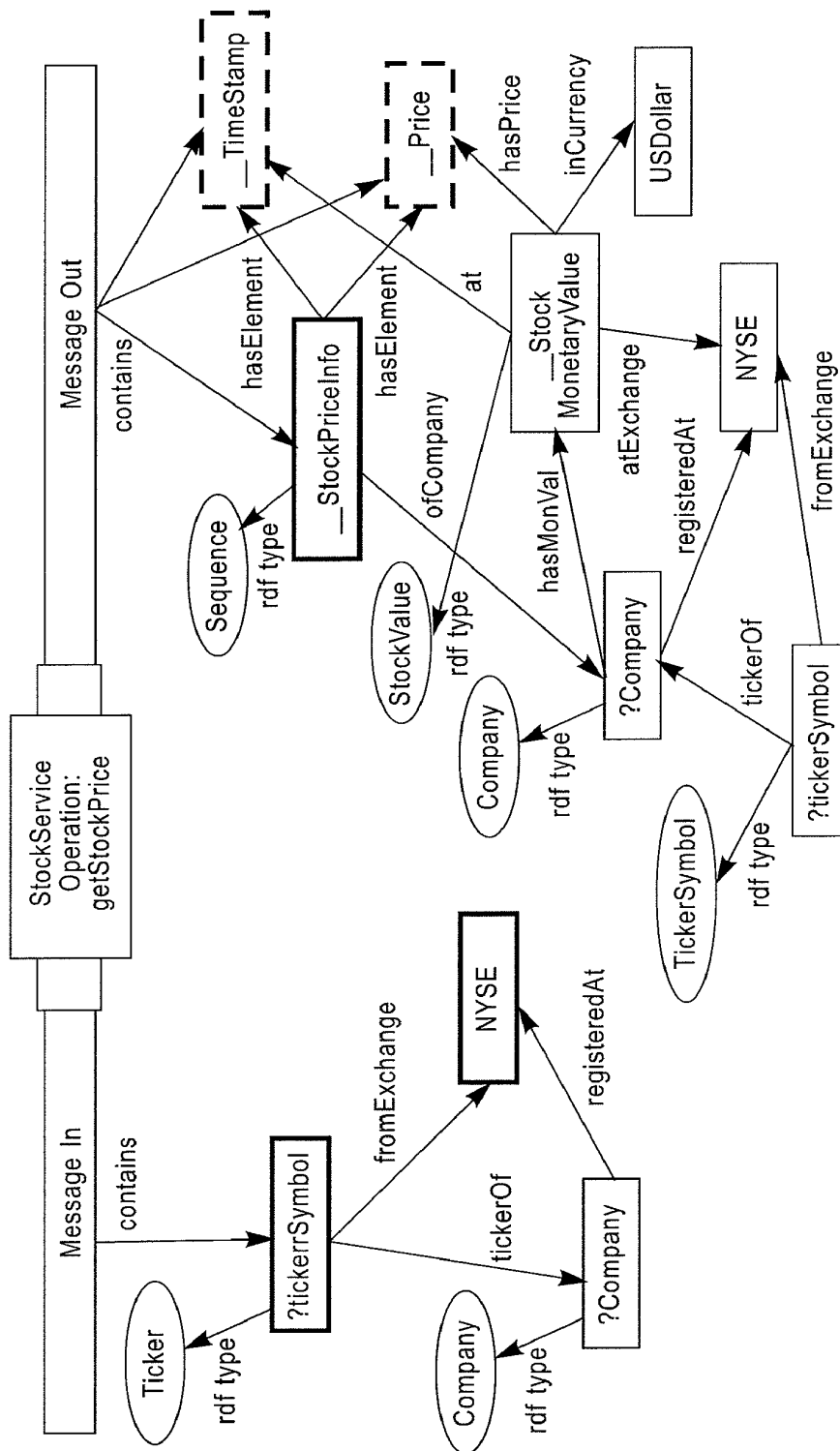


FIG. 1

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