XIR: XML Information Representation Module for Sensor-based Information Processing Systems
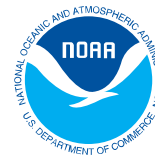
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Problem Formulation

How to develop methods for the coupling/binding representation of data and metadata entities associated with physical sensors pertaining to environmental surveillance monitoring (ESM) applications.
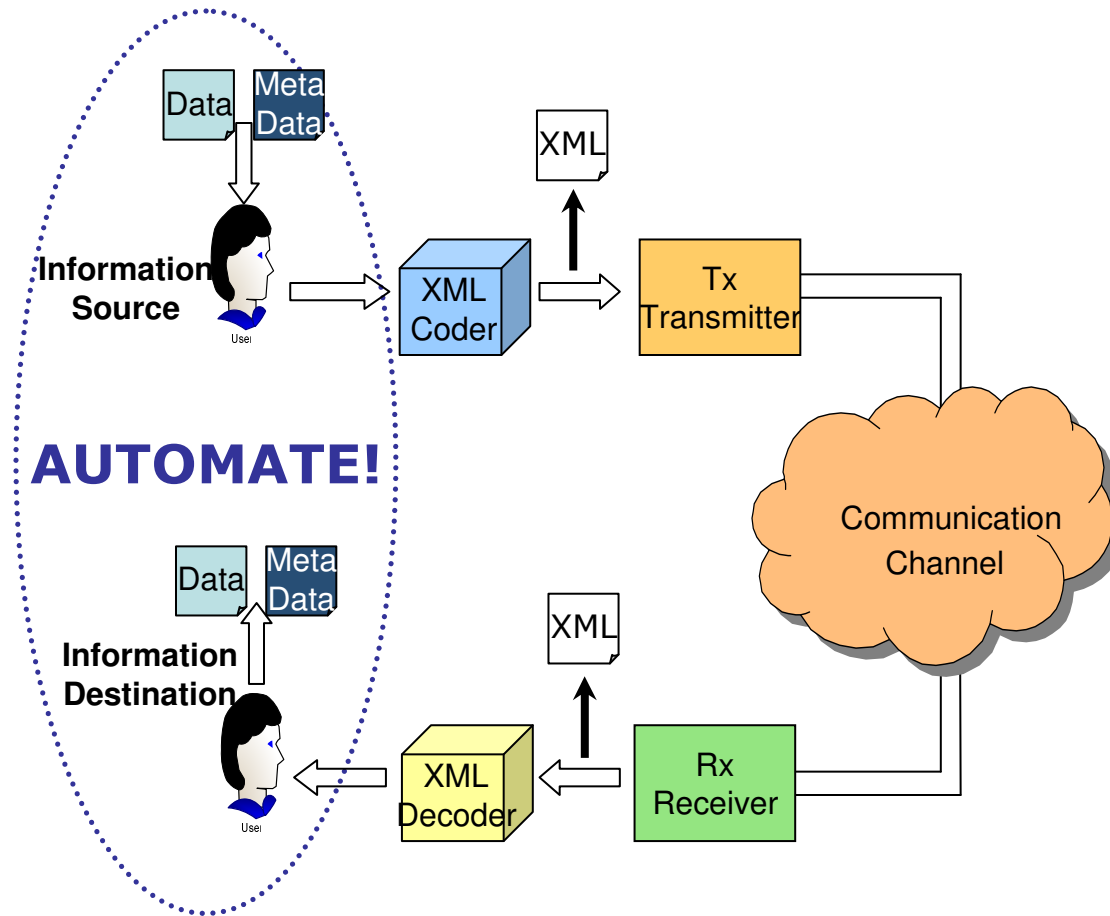
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Methodology (Information-theoretic Approach)

Shannon's Theory and XML Processing

- Information theoretic measures are used to study how the extensible markup language (XML) may serve as a means for integrating symbols and meaning (semiotics and semantics parts), from metadata, with signals and structure (syntactic part) from sensor based raw signal-data.

- Users may develop "stencils" in order to customize "XML tags" during encapsulation.

- Proposed solution contemplates *dynamic metadata management*.

- Data and metadata may be enhanced with user observations.

- Users may comment on received data by annotating additional comments and parameters (added metadata).

Application Tools

- Java

- FTP – File Transfer Protocol

- XML – eXtensible Markup Language is a general purpose markup language capable of describing many different sets of data. It provides a text-based means to describe and apply a tree-based structure to information.

Research Results

- Encapsulation
  - Encapsulation feature takes default stencil to merge two files together: data and metadata.
  - In addition to merge the two files into a new file, the encapsulation feature adds XML tags to each piece of data on the files.