Goal Oriented Information System for Internet of Things

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MOTIVATION

- To identify the interrelation of things in an IoT system and the interaction among them.
- To solve the issues like communication requirements of the system.
- To obtain requirements of people with special needs.
- To identify the nature of the things (Sensors and Actuator and their communication) in an IoT system.

WHY GISOT?

Goals in the ISoT system are oriented towards the achievement of functional and non-functional requirements.

Three types of ISoT goals. **Simple, Complex**(composed of simple goals) & **Abstract**(enters generalization/specialization hierarchy).

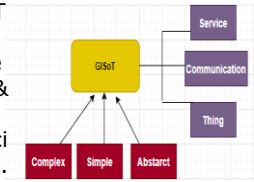


Fig. 1 The GISoT Model

WHAT IS GISOT?

The **GISoT**(Goals for information system of things) is a triple of the form: <S,C,T>
<Service, Communication , Thing>

The triple can further be decomposed to: <S,<Sender,Receiver,"Message">,Thing>

Example of a triple:
<Determine fall, <fall detector, Group of helper(nurse, wife),"please come">,fall detector>

APPROACH FOR GISOT REQUIREMENTS ENGINEERING PROCESS

Formulating the root GISoT

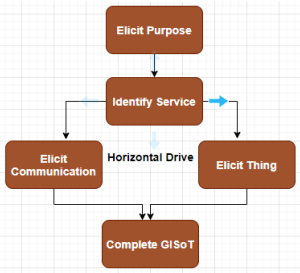


Fig 2: Root GISoT drive

Level	Service	Communication	Thing
1	Accident alert	Accident estimator, group(helper), "Help message"	Accident estimator, helper
2	Alert on air bag release	Air bag sensor, accident estimator, air bag released	Air bag release detector
2	Alert on seat belt tension	Seat belt detector, accident estimator , impact value	Seat belt tension estimator
2	Alert on impact	Impact sensor, accident estimator, impact value	Impact assessor
2	Report fire	Fire detector, accident estimator, fire value	Fire detector
2	Provide car position	Position detector, accident estimator, position value	Position detector

Fig: 3 Top Level GISoT Hierarchy for Car Accident

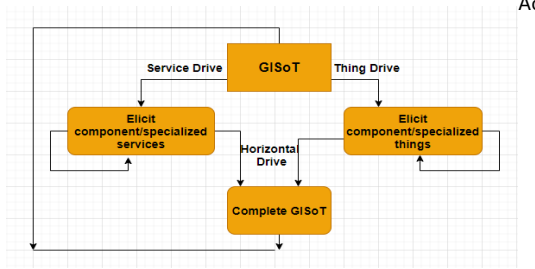


Fig 4: The Vertical Drive

Level	Service	Communication	Thing
2	Provide car position	Position detector, accident estimator, position value	Position sensor
3	Provide Roll	Roll sensor, position sensor, roll value	Roll sensor
3	Provide Pitch	Pitch sensor, position sensor, pitch sensor	Pitch sensor

Fig 5: Reduction of GISoT goal to provide the car position

Type of GISoT Drives: Horizontal & Vertical Drive

The process to obtain the goals are:

1. Obtain the root GISoT
2. Recursively obtain its sub goals till leaf goal is reached.

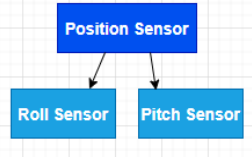


Fig 6: Thing Drive on position sensor

As shown in **fig 7**, there exists an and relation among the roll and pitch sensors for selecting the position of the car. Whereas, for impact or hierarchy exists and any of the choice between rear, right and left can be selected.

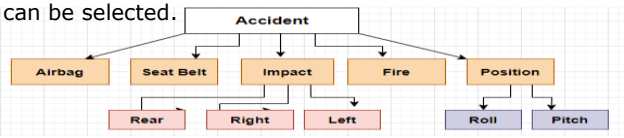
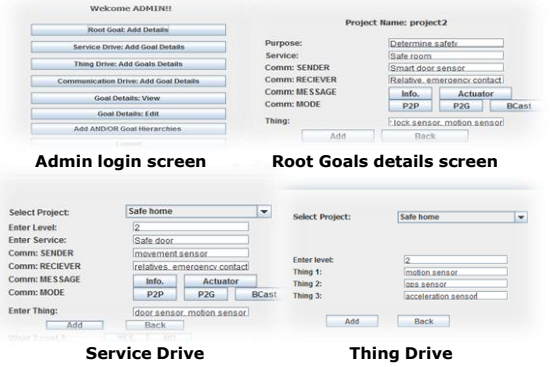


Fig 7: The GISoT hierarchy for car accident

USER INTERFACE OF THE GISOT SYSTEM



FUTURE WORK

Implementation and Design prospects of the GISoT System, to ensure the quality of development of ever changing application of IoT.

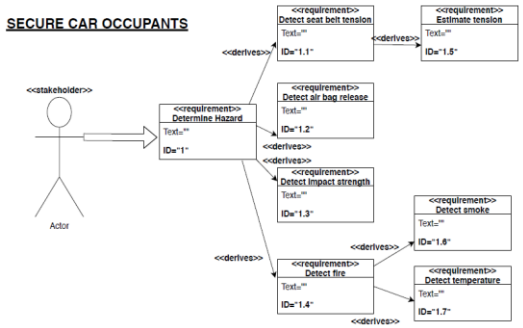


Fig 8: SysML Diagrams

REFERENCE

[1] Prakash Naveen, Prakash Deepika. Goal Orientation for the Information Systems of Things, Draft Report