STS-IQ Tool manual

The STS-IQ Tool (a snapshot of its interface is shown in Figure 1) consists of five main components:

- **Control component:** controls and coordinates the four other components;
- **Modeling component:** that enables for drawing the IQ requirements model by dragging-and-dropping the different modeling elements from palettes, specifying the properties of modeling elements along with the various relations among one another;
- **Model-to-text transformation:** that supports the translation of the graphical models into disjunctive Datalog formal specifications;
- **Automated reasoning support component:** that takes the Disjunctive Datalog specification that resulted from translating the graphical model, the reasoning axioms, the properties of the design, and then perform the required analysis.
- **Automated IQ specification component:** that derives the IQ specifications in terms of IQ policies.

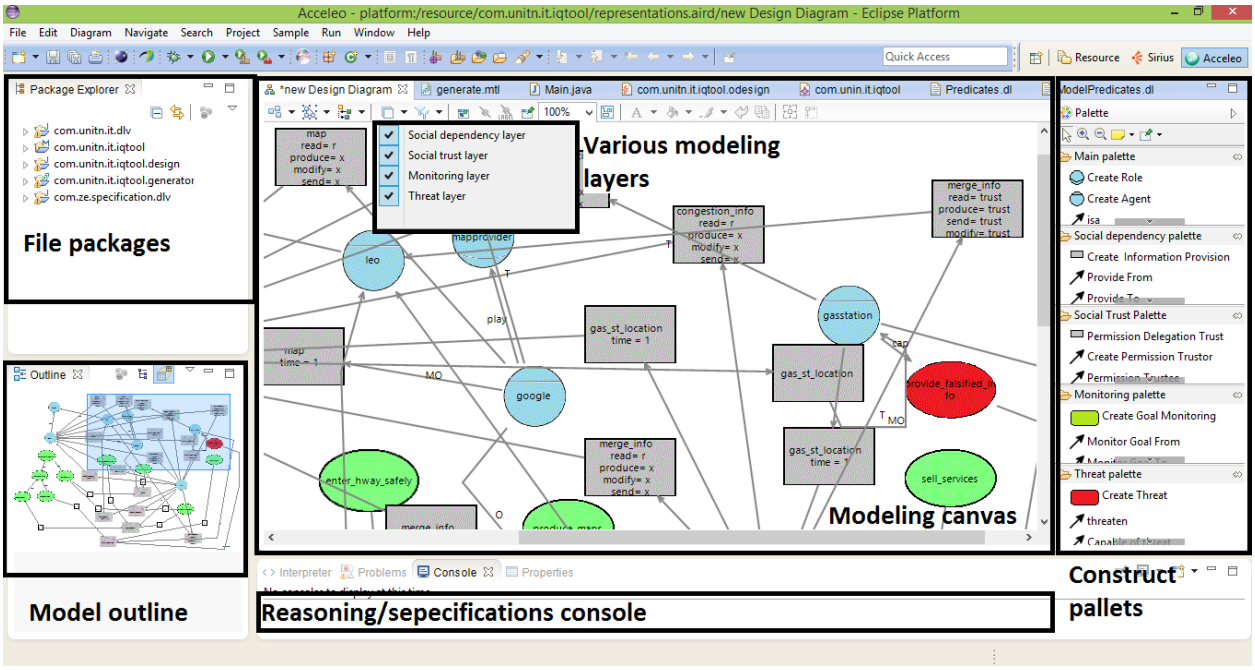

Figure 1

Modeling component: five different layers can be used for modeling IQ requirements

1- **The main layer:** contains the main modeling constructs (e.g., roles, agents, goals, information, etc.). Figure 2, shows the main layer along with the main palette. Note that none of the other layers/ palettes has been chosen.

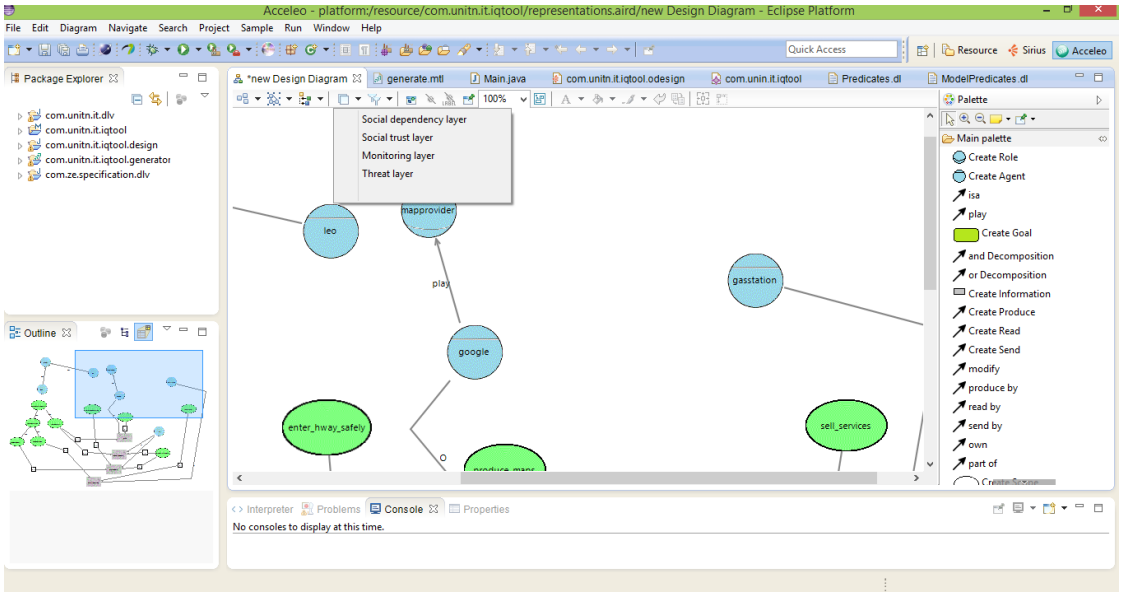

Figure 2

2- **Social dependency layer:** contains the social dependency constructs (e.g., goal delegation, information provision, and permission delegation). Figure 3, shows the main and social dependency layers along with their palettes.

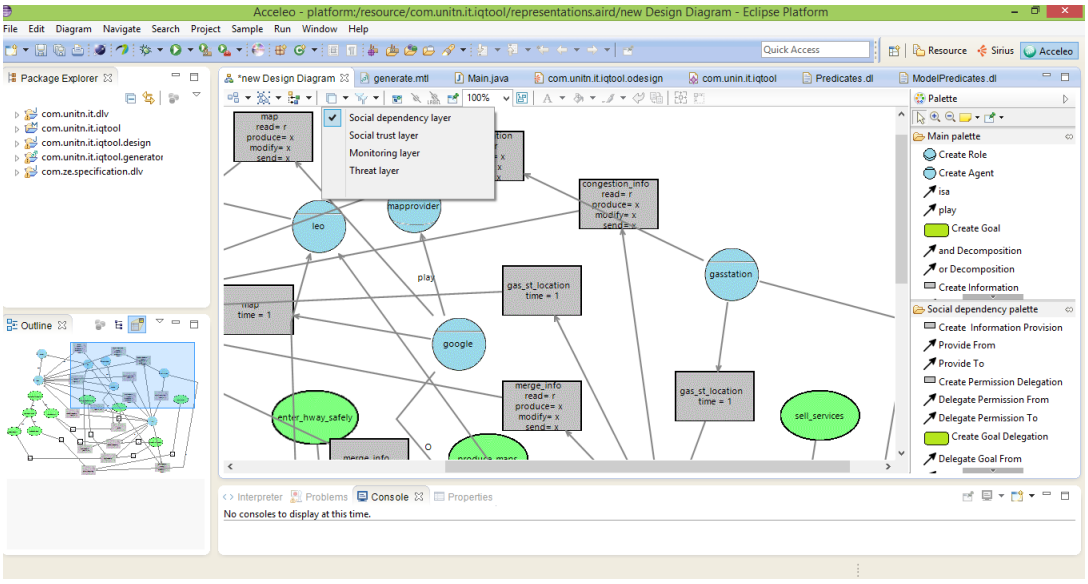

Figure 3

3- **Social trust layer:** contains the social trust constructs (e.g., trust for goal and permission delegations). Figure 4, shows the main, social dependency and social trust layers along with their palettes.

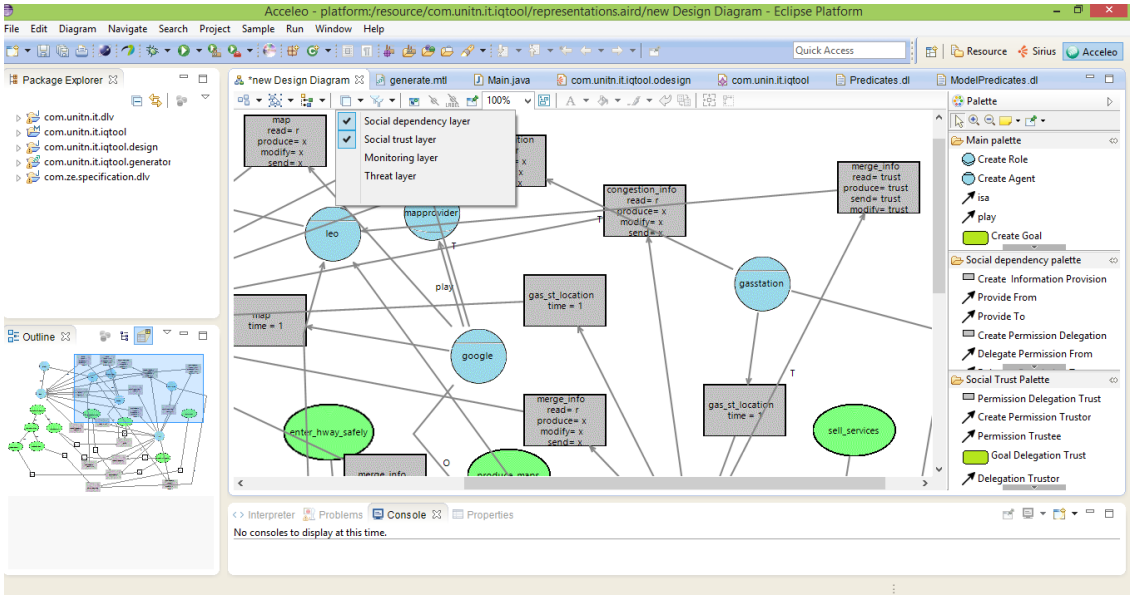

Figure 4

4- **Monitoring layer:** contains the monitoring constructs (e.g., monitoring for goal and permission delegations, monitoring for information). Figure 5, shows the main, social dependency, social trust, and monitoring layers along with their palettes.

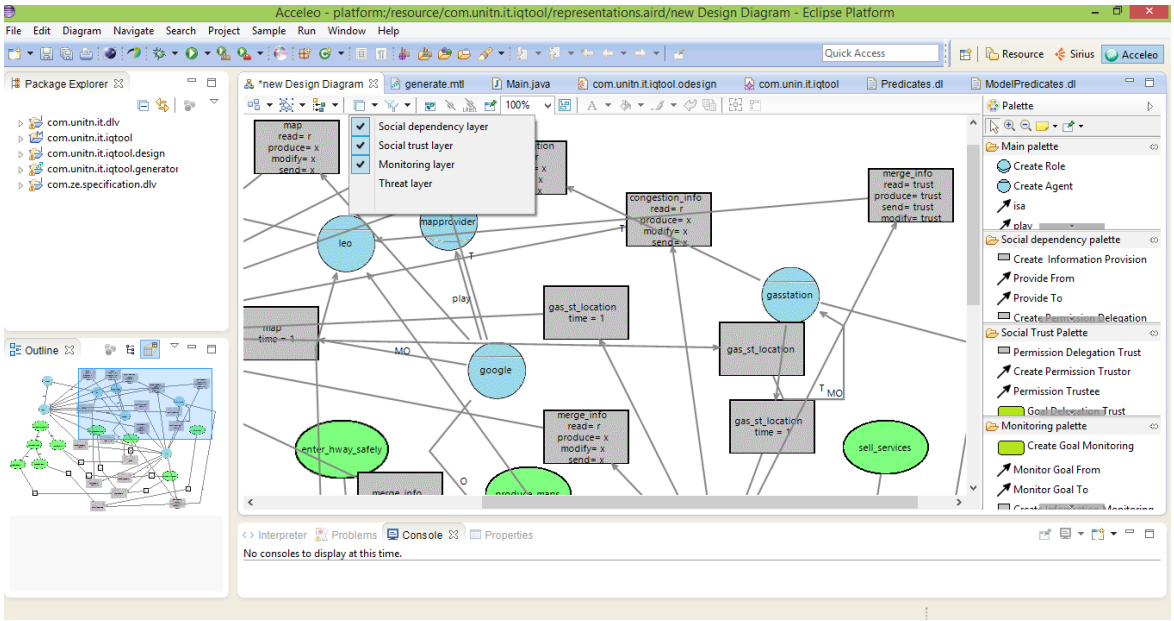

Figure 5

5- **Threat layer:** contains the **threat** constructs (e.g., **threat, threaten, etc.)**. Figure 6, shows the main, social dependency, social trust, monitoring and threat layers along with their palettes.

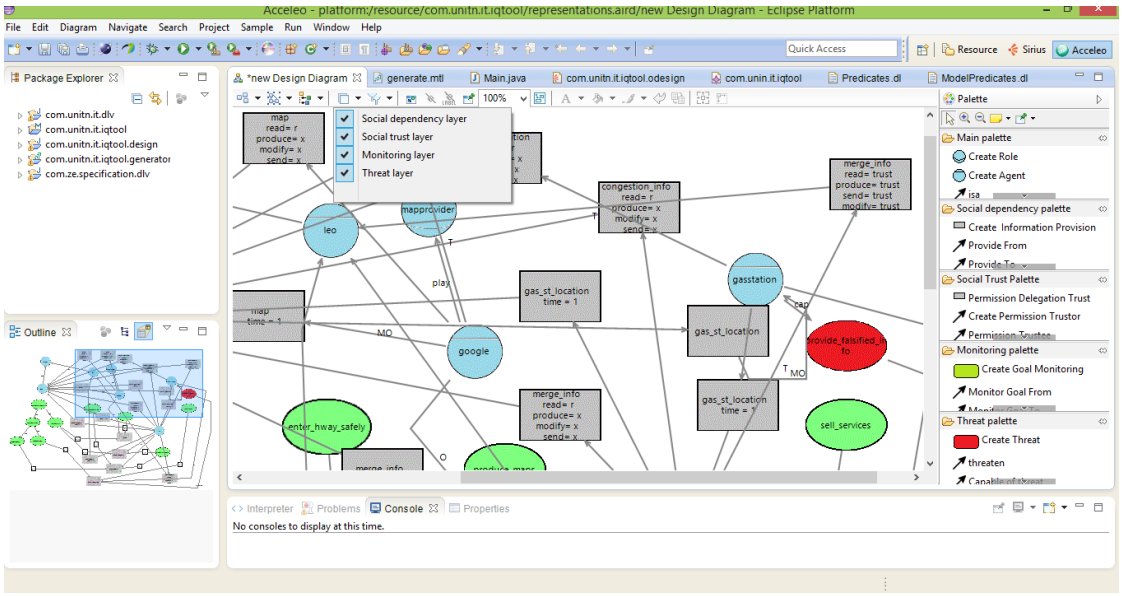

Figure 6

Model-to-text transformation: when you finish modeling the IQ requirements you can translate the graphical model into Disjunctive Datalog specification as shown in Figure 7

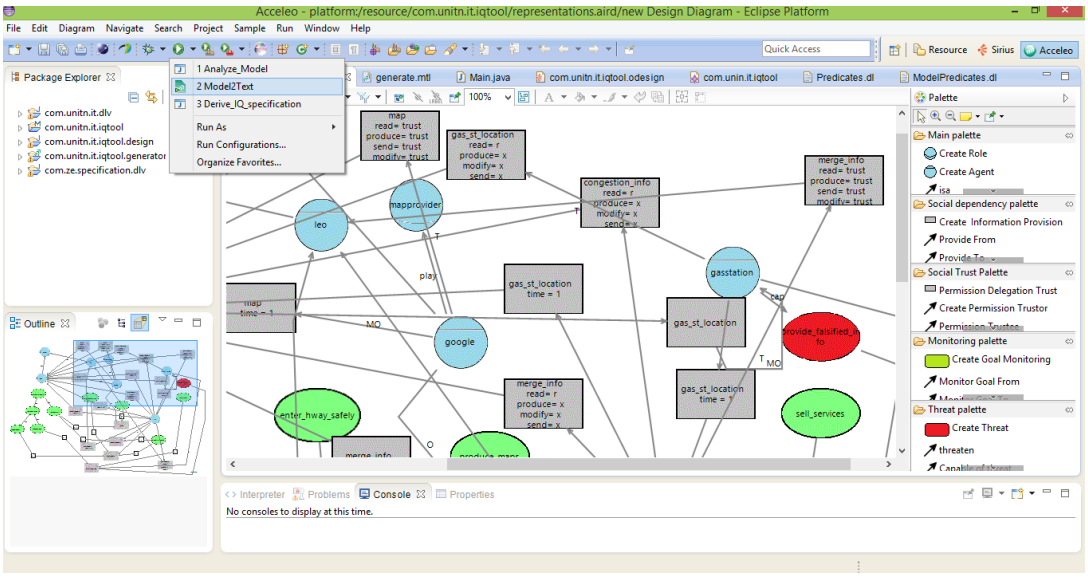

Figure 7

Automated reasoning support component: you can analyze the IQ requirements model as shown in Figure 8

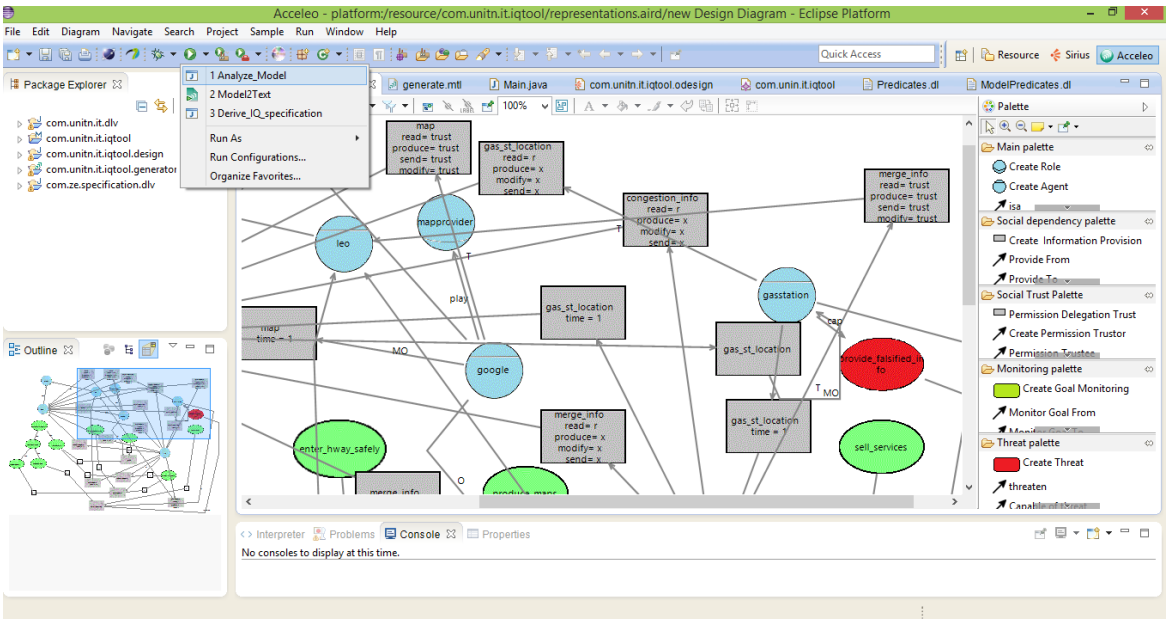

Figure 8

Automated IQ specification component: when the model is verified consistent you can derive the IQ specifications in terms of IQ policies as shown in Figure 9.

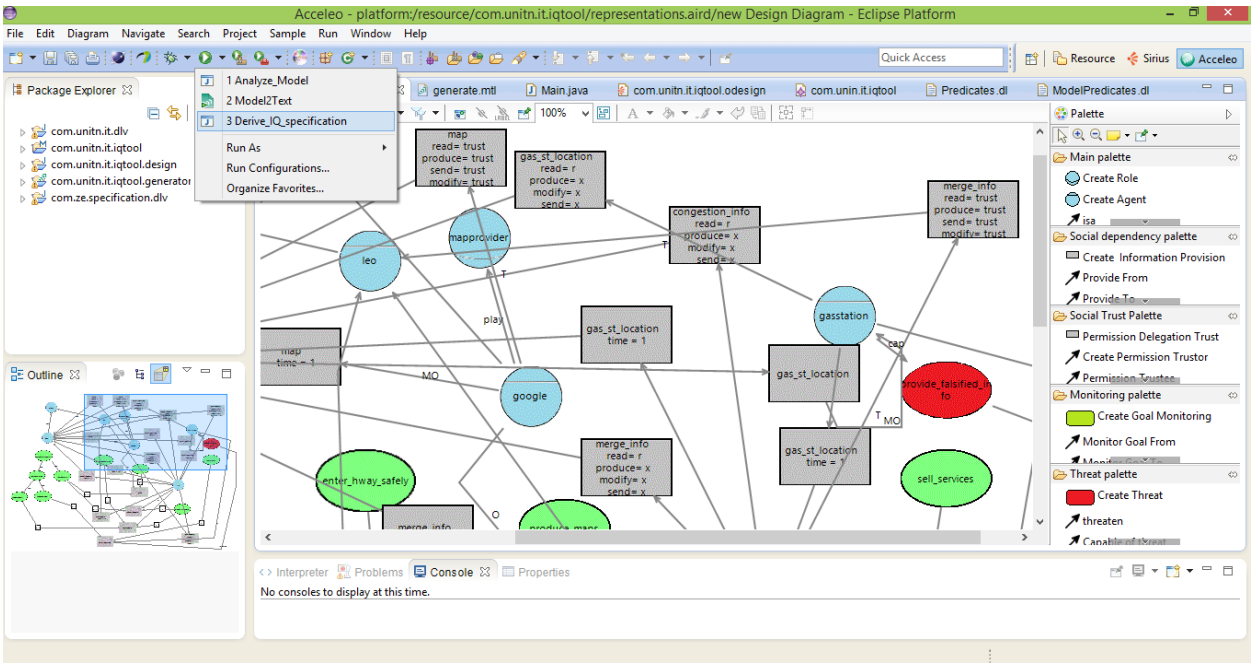

Figure 9