



1. What is ASQ-IT?

Architecture Structure Query is a Tool to enable learning about ITS architecture as described by ARC-IT. The ARC-IT website provides a great deal of information about ITS and ITS architecture; however, there is a lot more information contained in the ARC-IT databases than what can be fit on the ARC-IT site while maintaining its easy navigation and organization. ASQ-IT enables access to all of the information already available on the web site and more, in a form that is more specific to a user's intent.

2. How does it work?

The fundamental construct of ASQ-IT is the formation of a question developed by the user. Since ARC-IT has many different types of artifacts (e.g., physical object, information flows), some structure must be applied so that the question can be formed in a way that makes sense relative to ARC-IT's structure. ASQ-IT pre-defines the types of artifacts that the user can use to build questions. Each of these is defined in one ARC-IT viewpoint:

Data Element: a unit of data that has a precise meaning that is exchanged between logical processes defined in the functional view. Data elements can be related to information flows from the physical view.

Flow: information that is exchanged between physical objects. An information flow is defined in the physical view and may contain many types of messages, each of which may contain many data elements from the functional view.

Functional Objects: a group of processes in an implementable package that can be associated with a physical objects as defined in the physical view.

Gap: issue related to a shortcoming or duplication of possible solutions for interface implementation, as defined in the communications view.

Infrastructure: field and backoffice systems that participate in ITS. Infrastructure refers to the subset of physical objects defined in the physical view that are of type Center, Support or Field.

Physical Objects: person, place or thing that participates in ITS, defined in the physical view.

Processes: a function that must be implemented or an activity that must be performed to meet an ITS need, defined in the functional view.

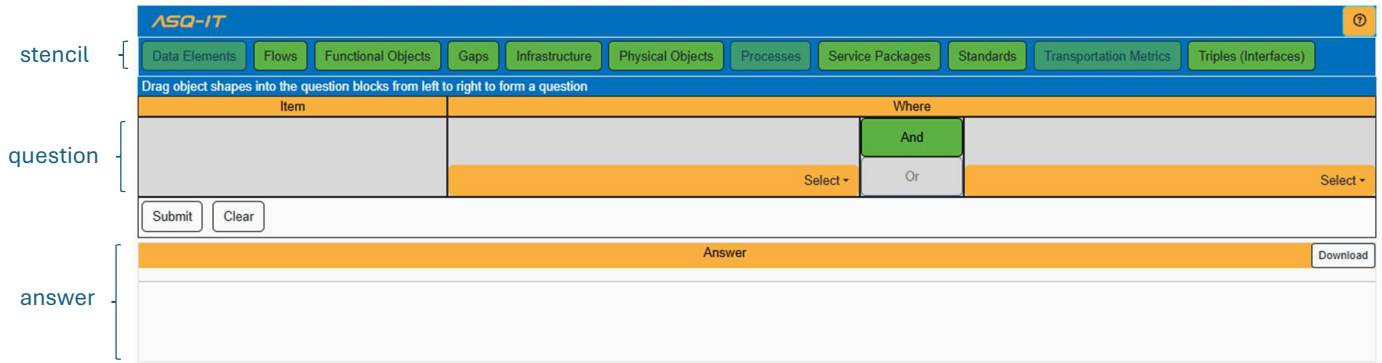
Service Packages: a portion of the ITS architecture that meets one or more user needs. Includes content from all other viewpoints and models (e.g., physical, functional, planning).

Standards: a formal specification that defines and governs some interface, function, or attribute of an implementation, referenced in the physical and communications view.

Transportation Metrics: measures of transportation effectiveness that can be associated with service packages. Defined in the planning model.

Triples (Interfaces): unique combination of a source physical object, an information flow, and a destination physical object, defined in the physical view.

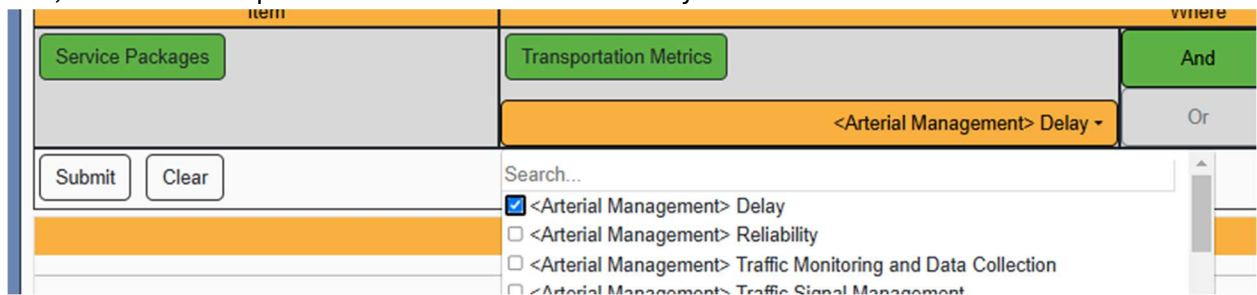
3. How do I use it?



The user interface contains three sections:

- stencil:** this is the library of elements you can choose from to build your question
- question:** this is where you build your question using two or three of the blocks
- answer:** where ASQ-IT provides results of your question

ASQ-IT's user interface supports drag-and-drop. Grab items from the stencil, drop them in the question row boxes from left to right. In boxes two or three (if used), if the 'select' pull-down is enabled, use the pulldowns to filter the objects considered in your question. For example, if you want to know what service packages impact arterial delay, put the 'Service Packages' object in the Item box, and 'Transportation Metrics' in the first Where box, and filter Transportation Metrics on 'Arterial Delay' as shown here:



Press 'submit' and receive results in the answer box.

Answer
The following Service Packages have been identified as contributing to enhancing Transportation Metrics: 'Delay': Count: 6
Service Package
CVO06: Freight Signal Priority
ST02: Eco-Traffic Signal Timing
TM03: Traffic Signal Control
TM04: Connected Vehicle Traffic Signal System
TM07: Regional Traffic Management
TM24: Tunnel Management

Most results will include hyperlinks that will take you to ARC-IT pages providing information about the specific results, i.e., clicking on TM24: Tunnel Management in the above example will take you to the TM24 service package page.

More complex questions might use the third box. For example, “What *standards* are used by the *micromobility OBE* and the *vehicle location and motion flow*?”

Item	Where		
Standards	Physical Objects	And	Flows
	Micromobility Vehicle OBE -	Or	vehicle location and motion -

The ASQ-IT user interface has been built to be as intuitive as possible, given the complexity of ARC-IT and the types of questions people may ask. Try different combinations, see how the tool reacts, and if there is something you would like to be able to ask but cannot, contact the architecture team—we are expanding the questions that can be asked, but will prioritize those that people ask about.

4. Can I ask a text-based question?

Not at this time, but a future version of ASQ-IT will enable English-like questions.

5. Is ASQ-IT AI-enabled?

Not at this time. ASQ-IT’s primary purpose is to educate, and since it is almost entirely database-driven it should be practical to train an AI-tool to learn. However, the ARC-IT databases are extremely complex, and further change both in content and structure with each version. Training and maintaining an AI to give answers with a high degree of confidence will be a significant task that does not synergize well with other ARC-IT team tasks; furthermore, as an educational tool it would be inappropriate to allow an AI tool to incorrectly answer a question, so the training process would be a substantial effort.