



I³ Program Brief

I³ Mission: The I³ consortium is an open consortium being created to encourage the accelerated formation of community-based IoT networks. These networks are formed when IoT device owners work together to create data “rivers” that have more composite value than a series of individual IoT data streams. To accomplish its goal, the I³ consortium will 1) work with suppliers to create an environment that simplifies the testing and evaluation of IoT networking components, 2) build and evaluate concepts and tools needed to create and manage trust in a community of independent device owners, and 3) distribute software and information to encourage the common evolution and networking of IoT communities.

Background: The I³ (Intelligent Internet-of-Things Integrator) is an innovative IoT data management system developed by USC’s Marshall School of Business and Viterbi School of Engineering with encouragement from the City of Los Angeles and other business interests seeking to create an ecosystem that will encourage the accelerated deployment of IoT technology by creating an environment that allows citizens and businesses to form community managed data marketplaces.

Significance of I³: Some researchers forecast that there will be 75B IoT devices connected to the network by 2025. That is equivalent to 10 devices for every person in the world. By this measure, the evolution of IoT will be even more impactful to the way we live and work than the Internet. USC, Los Angeles, and the companies that are working together to create the I³ consortium believe the benefit of IoT will be maximized when communities work together to utilize their data in a respectful, open, and trusted information exchange. Los Angeles has made many key contributions that helped shaped the emergence of the Internet and this effort along with many other endeavors highlighted during InnovateLA demonstrate our continued efforts to reinforce Los Angeles’s position as a global leader, as a visionary environment, and a source of inspiration. USC’s multidisciplinary approach to solving wicked problems and creating technological advances such as I³ demonstrates what can be achieved when diverse perspectives are brought to bear on a complex topic. The diversity that Los Angeles provides and the philosophies encouraged by USC create an environment which is a natural fit that make our region the focal point for many other future smart-community, smart campus, smart-city, and smart-government initiatives

Details: The I³ consortium is a first-of-its-kind open consortium that was created to encourage the formation of community based IoT networks. To do so, the consortium will 1) work with suppliers to create an environment that simplifies the testing and evaluation of IoT networking components, 2) build and evaluate concepts and tools needed to create and manage trust in a community of independent device owners, and 3) distribute software/information to encourage the common evolution and networking of IoT communities.

The specific goals of the I³ Consortium are as follows:

- Integrate software from different sources to create a city-scale IoT test/demonstration system.
- Create a test/demonstration system which can prove functionality, provide operational testing, and generate market data needed to evaluate return on investment.
- Expand our understanding of IoT marketplaces and privacy by evaluating concepts that encourage or inhibit the emergence of community data-rivers such as data ownership, incentives, and trust.
- Build an open-source deliverable from the core I³ software that can be distributed to other community based IoT data rivers to encourage systemic evolution from a common foundation.



- Develop network functions need to allow different and independent I³ data rivers to interact and exchange data.
- Stimulate IoT device deployment and data sharing by independent device owners by addressing security and privacy needs as a complement to an incentive and trust building system.
- Provide application developers a vehicle to access to aggregated real time IoT data-rivers on an as needed basis.
- Encourage increased application side use of data-rivers by AI systems, applications, and data brokers for more intelligent decision making.
- Create a virtualized representation of the IoT device to a network infrastructure in order to isolate the devices with uncertain pedigree from damaging the network.
- Create an environment that allows for the collection of operational and economic data that serves to allow return-on-investment analysis and field-operations usability feedback.

USC will act as the I³ consortium manager and will provide a suitable IoT test environment for the I³ consortium members. The test environment will be expandable to include the City of Los Angeles in order to demonstrate scalability. USC will seek corporate contributions and research grants to grow the I³ vision and to support research that makes use of the I³ environment. I³ members will have access to pre-release software and the testing/demonstration facilities. As an open-source program, non- I³ members will be encouraged to contribute to the I³ software based on the distributed software. Business research that comes from the I³ consortium will aid the City of Los Angeles (and other cities that follow Los Angeles’s lead by adopting I³) in developing a financially sound IoT deployment strategy.

The I³ consortium will support different levels of membership to encourage participation from individuals, small companies, and large companies alike. Interested companies will be free to select a membership level that matches their desired level of community interaction.

As I³ evolves, it has the potential to play a role in protecting the city for IoT centric cyber threats. It will also has the potential to allow the city to monetize city data as a possible source of incremental revenue. Finally, because I³ would allow citizens to volunteer their data for use in city operations, it has the potential to reduce the capital required to turn Los Angeles into a smart city AND improve operational decision making by expanding the data available to operational entities.

<u>I³: A win-win game plan</u>	
I³ in a Nutshell: Users send data from their IoT devices to the I ³ data marketplace Applications search the data marketplace for the data they need Applications apply for access with a data policy and incentive offer Users approve or deny requests for access	For USC: Companies show the latest IoT for operational/educational purposes Establishes USC as a leading IoT business-technical institution IoT platform supports research AND USC operational excellence USC reports can be a benchmark for IoT device/application certification
For the Application Developer: Encourages data entrepreneurship; valuations based on analytics Reduces startup capital needs; data purchased as needed Creates a new businesses– the independent data broker	For Los Angeles: A means to test latest IoT and evaluate IoT return on investment Establishes Los Angeles as the IoT silicon valley (its not just apps) IoT improves citizen quality of life and city operational efficiency Reduces IoT capex forecast by reusing citizen/business IoT device base
For the Device Owner: Provides control over who/how companies use your data Trust model encourages ethical business behavior Incentives encourages device deployment and maintenance	For Cities/Governments: Provides a basis to monitor against IoT cybersecurity threats Based on an operational model to ensure fiscal sustainability IoT can provide a source of revenue above/beyond taxes
<ul style="list-style-type: none"> • <i>IoT will become the basis for a next generation Internet and in doing so, it will reshape everything</i> • <i>USC, Los Angeles, and the other I³ members: Leaders in an emerging/enabling infrastructure space</i> 	