# Living Analytics Research Centre (LARC)

***Living Analytics*** = ***Consumer & Social Insights From Experiment-Driven Closed-Loop Analytics + Societal Scale Human Networks***


The **Living Analytics Research Centre** (**LARC**) seeks to make Singapore a premier location for the development and applied use of a new generation of consumer and social analytics for the network centric world. **LARC** is developing new concepts, methods, and tools that are experiment-driven, closed-loop, more real-time, and practical at societal scale. **LARC** aspires to transform and expand computational social science as well as to develop new applications that benefit individual consumers, private sector organizations, and the public sector.

A joint collaboration between the Singapore Management University (SMU) and Carnegie Mellon University (CMU), **LARC** is physically anchored at SMU's School of Information Systems in Singapore and at CMU's Heinz College in Pittsburgh Pennsylvania, USA. **LARC** brings together i) machine learning, ii) statistics, iii) social and behavior science, iv) management science, and v) the science underlying network structures, in innovative but practical ways. **LARC** is working with industry partners to demonstrate its new approach to *Experiment-Driven Closed-Loop Analytics.* For example, **LARC** will help service providers learn how to provide context-relevant information and incentives to consumers at the right time, in the right way. **LARC**'s concepts, methods and tools will form a Living Analytics Technology Platform that external parties can license.

**LARC** is distinctive and path-breaking because of its integrated focus on:

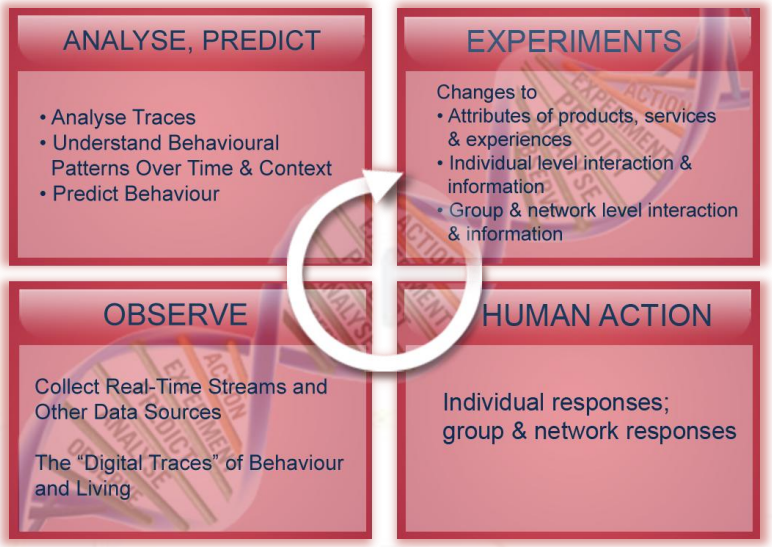
a) **Experiment-Driven Closed-Loop Analytics** that provide a systematic approach to adaptive policy formulation and evaluation based on consumer and social insights derived from online experiments using digital traces of behavioral data of large numbers of real-world users. This requires the ability to i) capture consumer and social data from existing and new channels, ii) develop policy interventions, iii) design experiments, and iv) to evaluate the results systematically, on a continuous basis with large numbers of users, in order to observe their actual preferences and choices. **LARC**'s data come from revealed consumer behavior on platforms operated by collaborating external partners, publicly available web and social media sources, and from IDM-sponsored national testbeds in Singapore, such as SMU's LiveLabs Urban LifeStyle Innovation Platform.

b) **Network Experimentation** that focuses on methods and supporting tools for analyzing consumer and social behavior when individuals are interlinked through various types of interaction networks. **LARC**'s key challenge is to develop the next generation of statistical tools for the design and analysis of experiments when observations are not independent due to network interactions and influences. These tools will enable policy evaluation in evolving, networked environments.

c) **Data Confidentiality, Privacy and Security** research that addresses the diverse challenges associated with protecting the confidentiality and privacy of the individuals whose data are part of the Living Analytics work. Privacy-sensitive statistical analysis requires the development of new methods that maximize data utility subject to confidentiality constraints. **LARC**'s efforts will leverage CMU's and SMU's exceptionally strong research capabilities related to data security and privacy protection.

**LARC** was established with a five year (2011–2015) grant from Singapore's National Research Foundation (NRF) through the multi-agency Interactive Digital Media Programme Office (IDMPO) hosted by Media Development Authority of Singapore. The combined total of this Singapore government investment and the in-kind contributions from SMU and CMU exceed S$52 million.

## The Living Analytics Adaptive Learning Loop




- The loop begins with **the Observe stage** that involves observing user interaction and relationships within a network in real-time and gathering their digital traces.
- **The Analyze and Predict** stage takes these digital traces, conducts analysis on them, discovers patterns in them, and uses these patterns for future user behavior and network trend prediction.
- **The Experiment stage** involves testing how individual users and networked groups respond to changes in content, service offerings, interaction experience, pricing and incentives. The Experiment stage also tests how users respond to different types of guidance and feedback.
- Finally, **the Human Action stage** is where users respond within the experiment, and to various types of feedback, and this generates the data that is picked up on the next cycle of observation.

## The Key Research Areas for Living Analytics

LARC aspires to become the world's foremost highly integrated effort in an "open" university setting to develop and advance work at the intersection of these five research areas shown below.