# Social AI Platform

## Using Digital Twins to Enable Individualized and Resilient Social and Organizational Change

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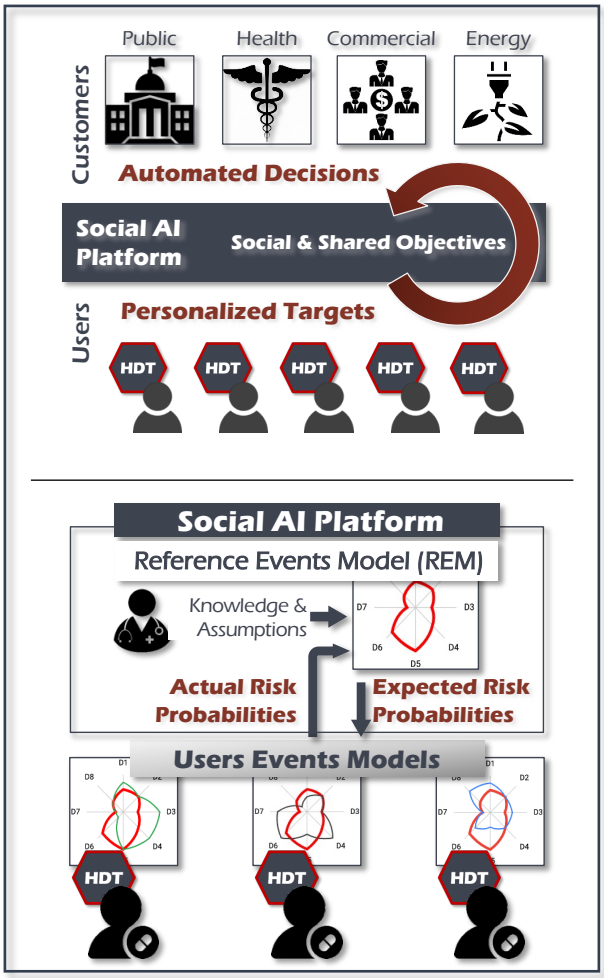
## What is the Social AI Platform?

Social AI uses digital twin concepts to enable public and commercial organizations to automate complex people-based scenarios and decisions. It also enables people to automate their complex social transactions based on their personal preferences and lifestyle.

## Enabling Individuals-Based Change

**Imagine** an ICU doctor in Boston finding that a patient has unexpectedly reacted to a specific treatment and can immediately update another patient's "treatment risk profile" in Delhi or Sydney, lowering their risks of complications. **Imagine** a city traffic center that identifies an "accident risk profile," prompting all city drivers—through a smart app—to change their driving patterns according to their own individual preferences, thereby reducing accidents. **Imagine** a warehouse operator in Singapore anticipating weather-related delays and updating a "weather delay profile" that triggers each shipment passing through that warehouse—worldwide—to revise its projected delivery time—on its own!—thus avoiding costly unplanned delays and ensuring supply chain resilience. **Imagine** a health organization discovering a new virus in a specific location, labeling it as dangerous, updating the city's "pandemic risk profile," and through a smart app, immediately reducing or limiting people's preferences for visiting that location and reducing their social interactions, but each according to their individual needs, all of which adds up to increase distancing and avoid pandemics without the need for lockdowns. **Imagine** a child going about their daily activities and relying on an "abuse risk profile" to receive nudges through a smart band to adjust their actions to reduce their risk of being mistreated while also connecting them to others they trust throughout their entire environment, therefore protecting them digitally and minimizing their risk of abuse. **Imagine** a maintenance operator on an oil rig identifying a hazard associated with the operation of new equipment, updating their own "work risk profile" on a smart app, and immediately communicating the new risk to all workers involved with the equipment on all rigs worldwide, lowering their risk of accidents and avoiding operational interruptions. **Imagine** a person who has two hours to go shopping and dine. She defines a "shopping experience profile" on a smart app, which leads malls and shopping centers to offer discounts and promotions matched to her items, preferences, time, location, and budget, thus providing her with a personalized shopping experience while boosting their own stores and brands. **Imagine** a person who is at risk of a specific disease and relies on a "disease risk profile" from




a trusted health organization to receive real-time advice—via a smart app—on how to adjust their choices and behavior to reduce their risks for that disease, while considering their preferences, habits, and lifestyle, thereby lowering their own risk as well as the risk of the entire community. **Imagine** a company that dynamically plans its operations, defining "task profiles" that reflect skills, locations, competencies, or rates, thus allowing thousands of workers to use a smart app to match their skills and abilities to the various tasks, replanning their social activities to meet their tasks based on their preferences and lifestyle, all in seconds. **Imagine** a tourist visiting a new city. A week before her arrival, she creates a "trip preferences profile" in a smart app, based on which various public and commercial organizations share with her timely, updated information, offers, or alerts tailored to her cultural, dietary, or health preferences, providing her with a unique, smooth experience, saving her time and effort,

and allowing the city to predict and optimize its resources and increase its tourism service capacity. **Imagine** following a natural disaster; a team of humans, robots, and drones all rely on a shared "mission risk profile" to undertake a rescue mission. Each team member—human or machine—uses their own smart app and the mission risk profile to predict their individual risk exposure based on their task and circumstances and then update the mission risk profile (and everyone else's) risk assumptions with real insights, thus reducing team risk and enhancing mission success.

Now, **imagine** all the above scenarios occurring proactively, automatically, simultaneously, and with little to no human coordination. Finally, **imagine** that we can support all of these scenarios on a single platform with hundreds of scenarios and millions of users, where each user can choose which scenario to subscribe to through the same smart app, the Human Digital Twin (HDT), where the HDT tailors each scenario to its user's preferences, where the scenarios can "talk" to one another, learn from one another, and exchange information in a predictive, adaptive manner based on the user's needs, preferences, and objectives.

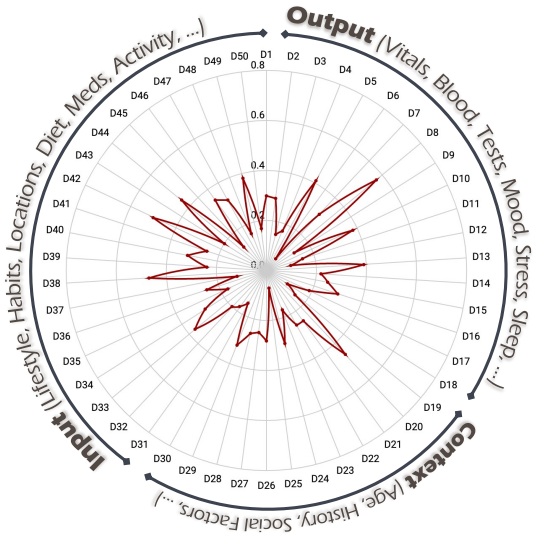
If you can imagine all of the above, then now you know what we hope to achieve with the Social AI Platform!

## How is Social AI Platform Unique?

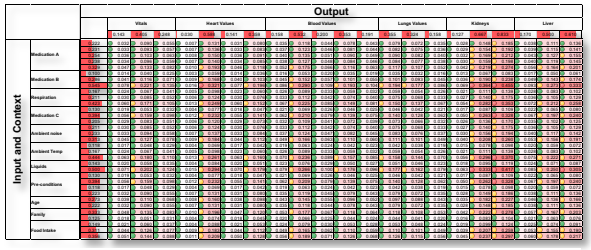
The Social AI Platform is powered by a proprietary Bayesian-based algorithm we call the Semantic Algorithm. The Semantic Algorithm calculates, assigns, tracks, and updates the impact probabilities of hundreds of parameters related to a scenario in near real-time. However, the unique feature of the platform is the Information Heat Map (IHM), which stores the probability profiles associated with a scenario for all users who have ever been linked to the model. In a mature context, the IHM can be seen to contain what might be called a "Scenario DNA" in the form of scenario-specific parameters and events probabilities. As such, an event assessment conducted by a user in Singapore can assist another user in Tokyo or Los Angeles in assessing a similar event, as long as both users are connected to the same IHM. That is, the Social AI Platform enables adaptive crowd intelligence, where change impact estimated by one member of a population can be used—if desired—to help other members adjust their assessments and future choices for similar changes. Furthermore, scenario owners can incorporate new facts and assumptions about potential interruptions into the IHM as probabilities of occurrence and reflect them to all users in real-time, improving risk forecasting accuracy across the platform and, ultimately, improving social and operational resilience.

## How to Start?

Based on historical data, we recommend exploring the concept by defining Information Heat Map (IHM) for specific scenarios to assess the feasibility and potential of the approach for the scenarios in scope and provide insights into the effort required to scale up to a Social AI solution.




Representation of an Information Heat Map (IHM) probabilities to manage a specific disease' risks. The model captures all key disease-related parameters in terms of their probability of affecting people. The HDT's provides the many input, output and context parameters unique to each user.




A notional Information Heat Map (IHM) depiction, which is the basis for the above radar representation. In addition to the risk profile, the model generates a heatmap for specific input/output correlations. The heatmap defines the reference values that the various HDTs use to assess users-specific risks based on their individual context and preferences.

## Our Role

We are information architects. Our role is to design the Social AI Platform information architecture necessary to automate various organization-people scenarios, design the information architecture of the required HDTs in support of the various scenarios, and provide the algorithms and logic necessary to optimize the scenarios and enable the platform. Pending patents cover the methods and algorithms that underpin the Social AI Platform. The Human Digital Twin (HDT) concept is discussed in several research papers (www.orcid.org/0000-0002-2775-6946).

## Contributions

Sherif Elshamy, Egypt | Amr Yousry, UAE | Dr. M. Miller, Germany | Simon Ang, Singapore | Sajana Krishnan, USA | Dr. Rokya Camara, Germany.