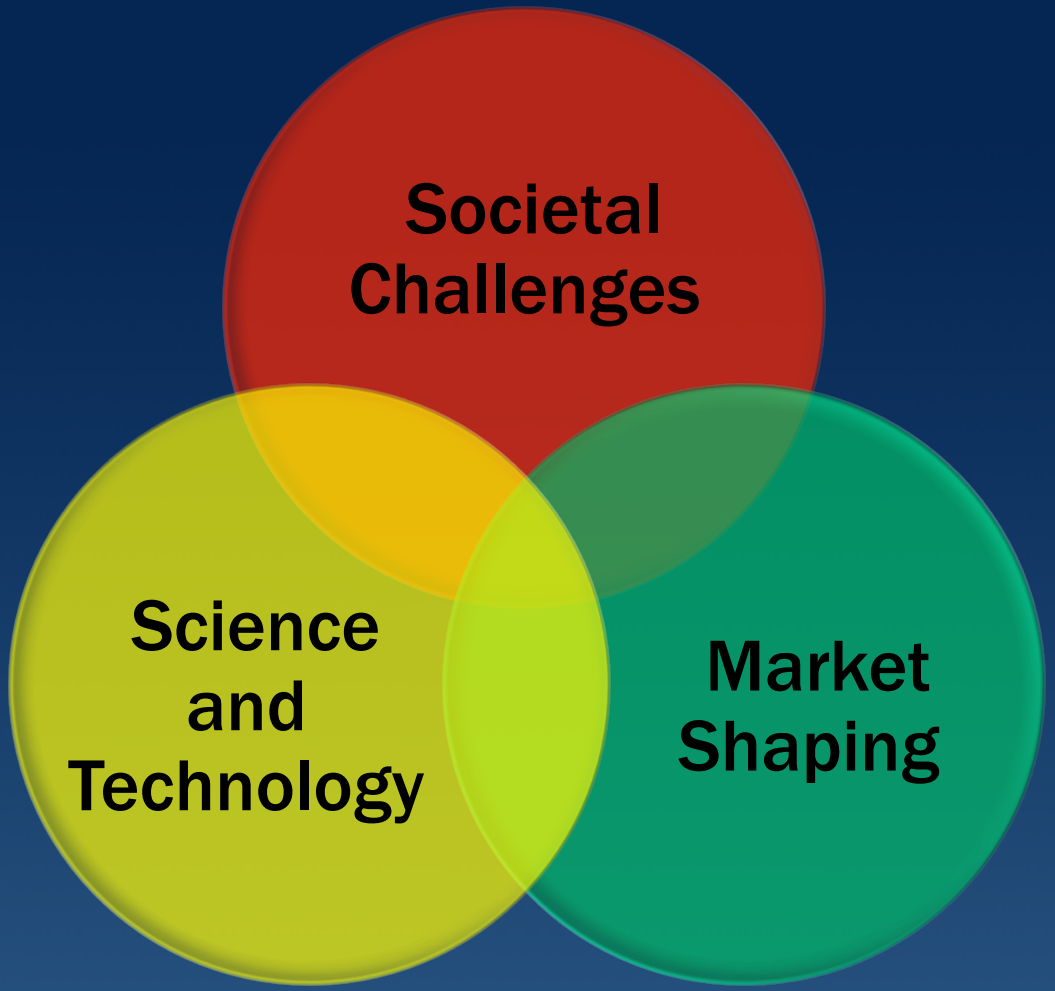
Creating Markets to Address Societal Challenges

Thomas Kalil
Deputy Director, Technology and Innovation
Office of Science and Technology Policy
Executive Office of the President
October 28, 2015


Societal Challenges
Science and Technology
Market Shaping

Premises (1)

- Science, technology and innovation unlikely to solve societal problems but it may be able to make a contribution

- We may be under-utilizing S&T as an approach to address societal challenges because:

  - Market may be under-investing

  - A number of relevant government agencies have modest capacity to use S&T to advance their mission

Premises (2)

- "Market shaping" approaches may accelerate the definition, development, evaluation and adoption of innovations to address societal challenges

- Government currently has many mechanisms to make financial commitments contingent on failure (loan guarantees) – governments should have more ways to make commitments that are contingent on success

Examples of societal challenges

- By age of 3, children from low-income families have heard 30 million fewer words than their more affluent peers
- Only 20 percent of low-income student are proficient in 8th grade math
- More than 36 million American adults are reading at the 3rd grade level or below
- Real wages for non-college educated workers have been stagnant since late 1970s

Market shaping

- Firms will not invest in innovations with high social returns and low private returns
- Example: pharma companies will underinvest in vaccines for people earning less than $2/day
- Global health community is using “market shaping” to encourage firms to develop health solutions
- Emphasis is on paying for outcomes as opposed to inputs

Market shaping (2)

- Incentive prizes
- Milestone payments
- Pooled procurement
- Advance Market Commitments

[Source: USAID: Healthy Markets for Global Health.]

Contribution of S&T-enabled solutions (1)

- High fixed cost, low marginal cost as opposed to costs that increases as a function of number of people served

- New insights about how people learn, acquire skills, make decisions from learning science, behavioral economics, etc.

- Anytime, anywhere access to IT-enabled services

Contribution of S&T-enabled solutions (2)

- Potential for continuous improvement through low-cost Internet-scale experimentation (A/B testing) data science, machine learning, etc.
- Personalization to needs, interests, skill levels
- Use of games to create engaging experience, keep people at “Goldilocks” level of difficulty

Contribution of S&T-enabled solutions (3)

- Use of AI to model interaction between expert and novice (e.g. digital tutors)
- Use of simulation to enable learning by doing
- Embedded assessment and evidence-centered design so that completion of a simulation is strong evidence of on-the-job performance

Example – adult literacy

- Barbara Bush Foundation Adult Literacy X Prize
- $7 million in prizes
- Teams must develop a mobile literacy application that significantly improves literacy for adults reading at/below 3rd grade level within 12 month period
- Cities Competition to encourage broad adoption of effective solutions

Future success story (1)

- Coalition of foundations agree to provide “milestone payments” or AMC for educational software
- Software must significantly increase performance of low-income students in some subject (e.g. early fractions or 8th grade math)
- Software must ultimately be rigorously evaluated in a realistic setting

Future success story (2)

- Coalition of employers sponsor development of

  - Free, authentic, online assessment that is competency-based and predictive of on-the-job performance

  - Resources to help people “level up”

- This helps people without a college degree get a higher wage job that might previously required a BA

Possible limitations of this approach

- Requires valid assessments for measuring progress
- Many interventions require persistence on part of users
- Interventions may require "blended" approach – e.g. combination of online learning, peer groups, and support services
- Ultimate outcomes only partially under control of the developer of innovation

Possible next steps (1)

- Support the formation of multidisciplinary, multi-sector working groups to design market shaping approaches:
  - What's the problem?
  - Can S&T make a significant contribution?
  - What market-shaping approaches would accelerate development, evaluation and adoption of a high-impact solution?
  - What support is needed?

Possible next steps (2)

- Increase capacity of public sector to use “market shaping” approaches, make financial commitments contingent on success

- Create “centers of excellence” that can provide technical assistance to stakeholders seeking to experiment with these approaches (e.g. Social Impact Bond Technical Assistance Lab)

- White paper competition to generate ideas

Possible next steps (3)

- Use of comparative effectiveness research to determine societal "willingness to pay," prospective benefit: cost ratio
- Explore portfolio of approaches (e.g. combining market shaping and impact investing)
- Companies "sponsor" the development of an innovation in the same way that they sponsor sporting events

Thank You

tkalil@ostp.eop.gov