National Institute of Standards and Technology

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Synthetic Biology Forum, NAS

Investment Focus

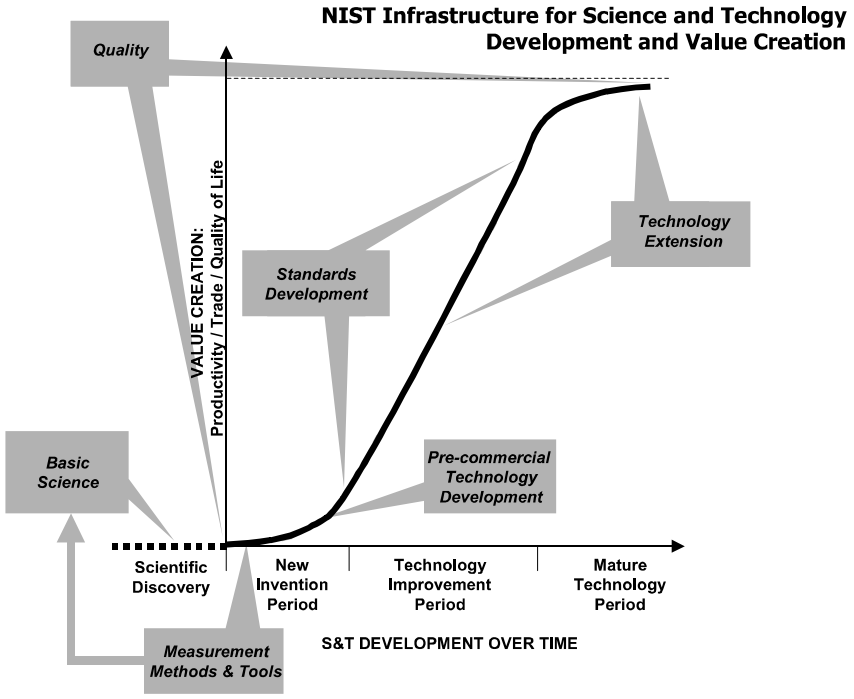
- NIST investment is casual at this point
  - <$500K, strictly intramural
  - new collaborative work at Stanford University
    - "Advances in Biomedical Measurement Science"
    - Co-located/embedded with SU faculty groups, private affiliates
- Developing rationale for formal and substantive investment
  - pursuing internal program growth
  - customers for NIST products will use engineered biology for
    - manufacturing
    - healthcare
    - foundational science
- NIST products reduce friction by enabling…
  - interoperability
  - reproducibility
  - confident decision making
- Focus on developing/disseminating infrastructure
  - where do existing standards and standards paradigms add value?
    - DNA Reference Materials
    - RNA Reference Materials
  - what new standards will help?
  - what new metrology paradigms are needed?
- Intramural focus on using SB as a tool to elicit the rules of biology:
  - *Wouldn't it be cool if we understood biology like we understand physics?*

Ecosystems

- What's the synthetic biology ecosystem?
- Right now, most enterprises develop their own approaches to making comparable measurements
  - comparability within an organization
  - limited permeability and exchange

Challenges

- SB is an emerging field; not clear what standards development will have useful impact
- NIST have deep expertise in standards development; but little experience with SB
- Current commercial activity is diverse; no clear “center of mass” of standards needs
- Metrology in Biology is nascent; things like sequence have no metrological basis



Issues

- What infrastructure will enable robust commercial activity?
  - Synthetic Biology as a key element in our economy
    - manufacturing
    - biomedicine
    - basic bioscience
- What will address regulatory uncertainty?
  - supporting private investment
- What infrastructure will enable science-based regulatory oversight?
  - development with confidence
  - deployment with confidence