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***How to Engage a Diversified Model
Developer Community Towards the
Same Ultimate Goal?***

Samar Saha, Ph. D.

Silicon Storage Technology, Inc.

Sunnyvale, CA 94086

Which Model to Use for Sub-100 nm Nodes?

- From users' perspective, the physics is not critical as long as the model is:
 - accurate
 - physics based
 - computationally efficient
 - continuous over the entire bias range
 - scalable, i.e. accurate over the entire range of devices of the target technology
 - well-defined for an efficient parameter extraction
 - easy to use.

How Many Models Do we Need?

- We need a “single” model of a device type for a specific technology for all applications such as:
 - analog
 - digital.
- A single standard model is critical for:
 - companies with global presence to
 - ❖ be cost-effective
 - ❖ maintain effective and efficient communications with different design centers
 - foundries to provide efficient services.

Support for More than One Model?

- As a model generator/user of a specific technology:
 - a single model would definitely be preferable for
 - ❖ efficiency
 - ❖ cost-effectiveness.
- However, more than one model can be supported and it is being done:
 - MOS
 - Bipolar
 - ...

Type of User-Developer Interactions

- Constant interactions among users and model developers during the development process to establish:
 - specifications / requirements
 - model characterization
 - model usage
 - feedback.
- Periodic interactions to provide insight through:
 - online journals / newsletters
 - seminars / workshops.

Technology Transfer: Academia to Industry

- Collaboration between academia and industry throughout the development process for model:
 - implementation
 - parameter extraction
 - characterization
 - benchmarking
 - release to users for qualifications.
- User involvement through:
 - publications
 - seminars / workshops.

Standard Model vs. Model Standard

- Standard model has advantages such as:
 - cost-effective for semiconductor companies and foundries
 - easy to generate
 - easy to maintain a common standard
 - ❖ within a company with global presence
 - ❖ in the entire semiconductor industry.
- However, disadvantages include:
 - lack of incentives for future R & D in modeling
 - continuous re-work on model deficiency.

Standard Model vs. Model Standard

- Model Standard would:
 - set up common standard with a set of guidelines for model qualifications
 - standardize common parameter name for each qualified model
 - promote future R & D in modeling
 - disadvantages include:
 - ❖ expensive to
 - ◆ generate and maintain multiple models
 - ◆ maintain a taskforce to set and update standard.