



# SystemC as a Tool for Product Definition

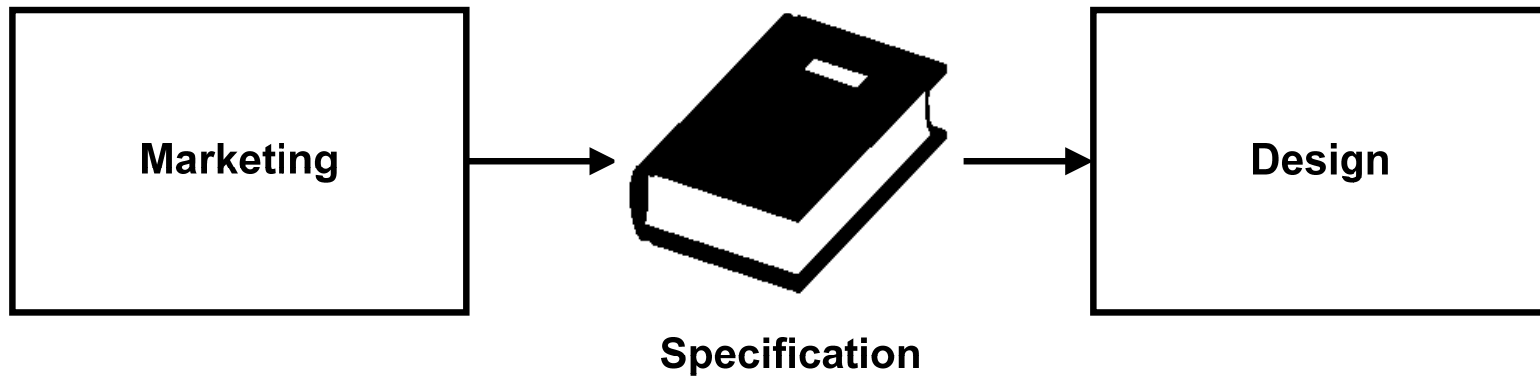
David MacAdam

Staff Architectural Engineer

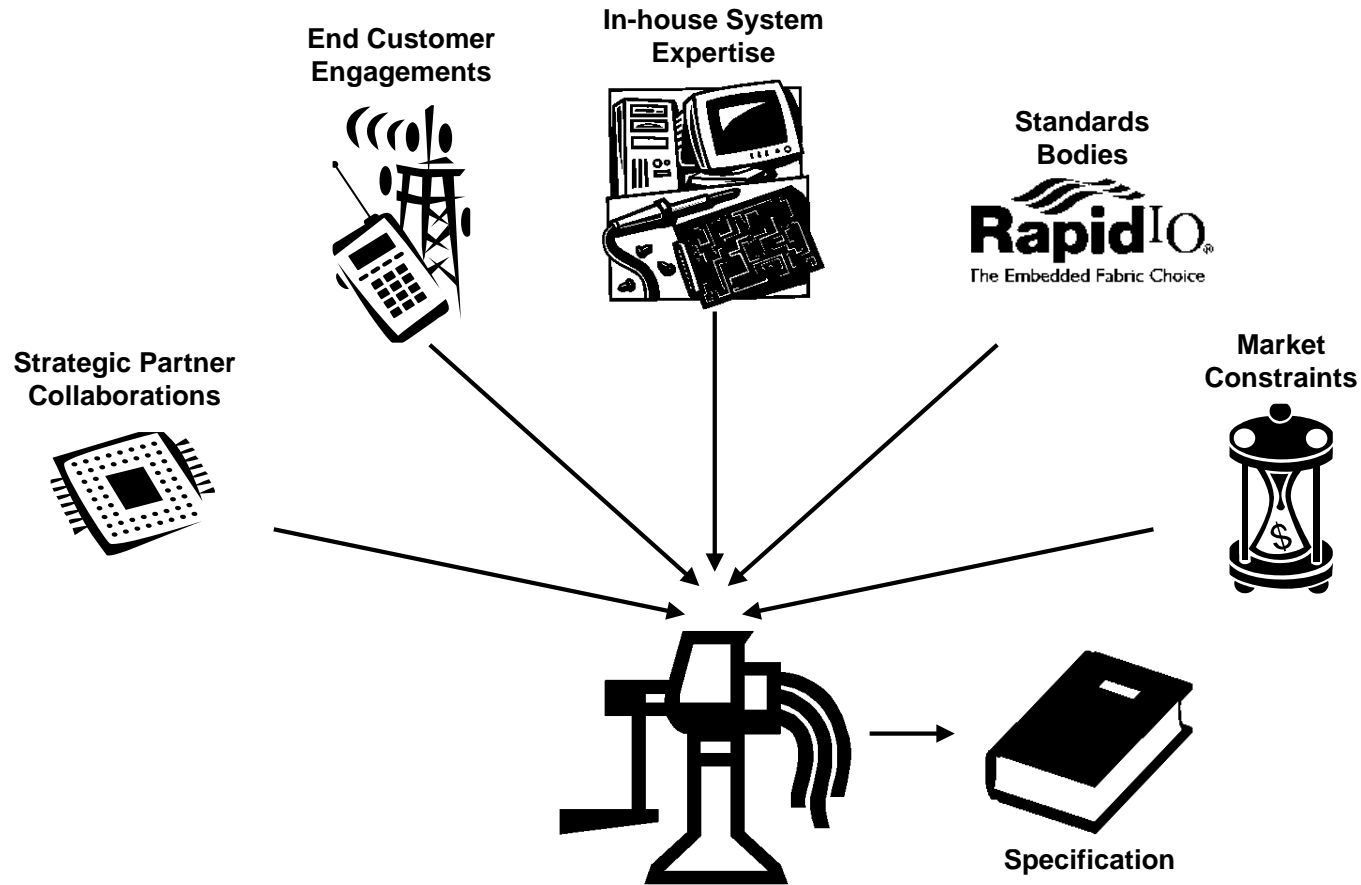
Integrated Device Technology, Inc.



## Product Definition – A Simple Concept

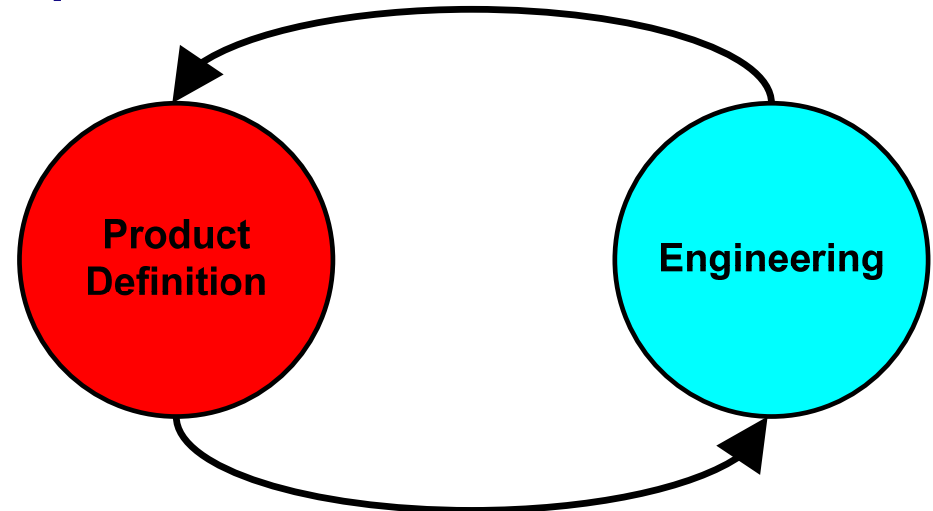


# Product Definition – A Daunting Reality

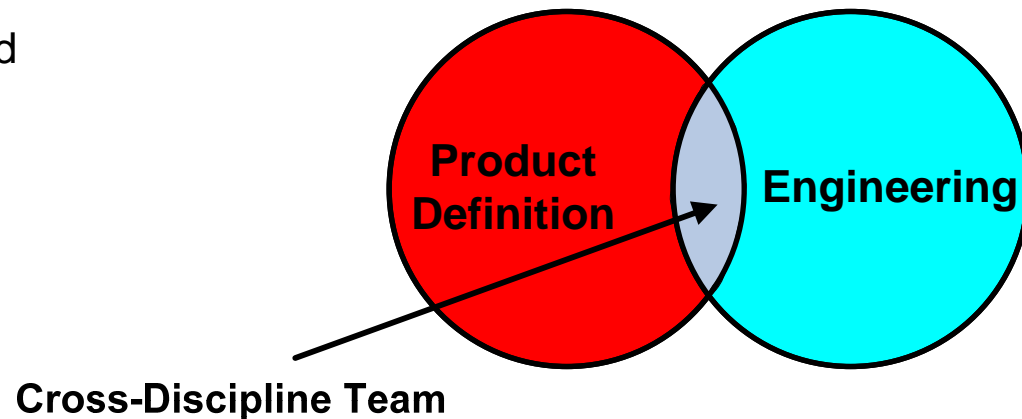


## Strategic Tradeoffs - Data Requirements

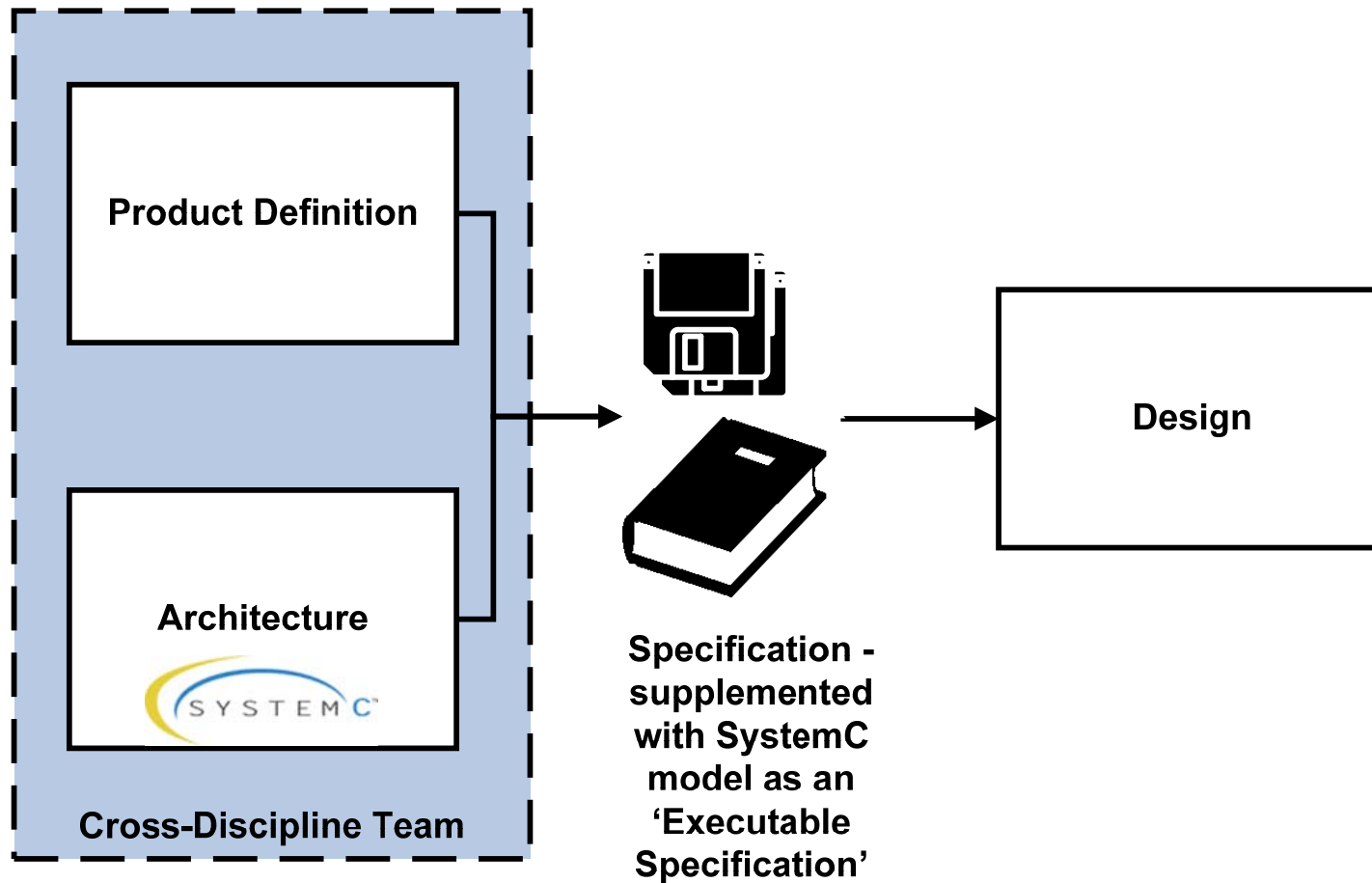
- Traditional approach for product definition to acquire data
  - Delayed into design phase
  - High cost
  - Risk of schedule slips, redesign and lost opportunities



- A new approach was needed
  - Earlier
  - Lower cost
  - Mitigate risks



# SystemC – The Enabling Technology



## Specification Effort – IP Module Supporting sRIO Switching

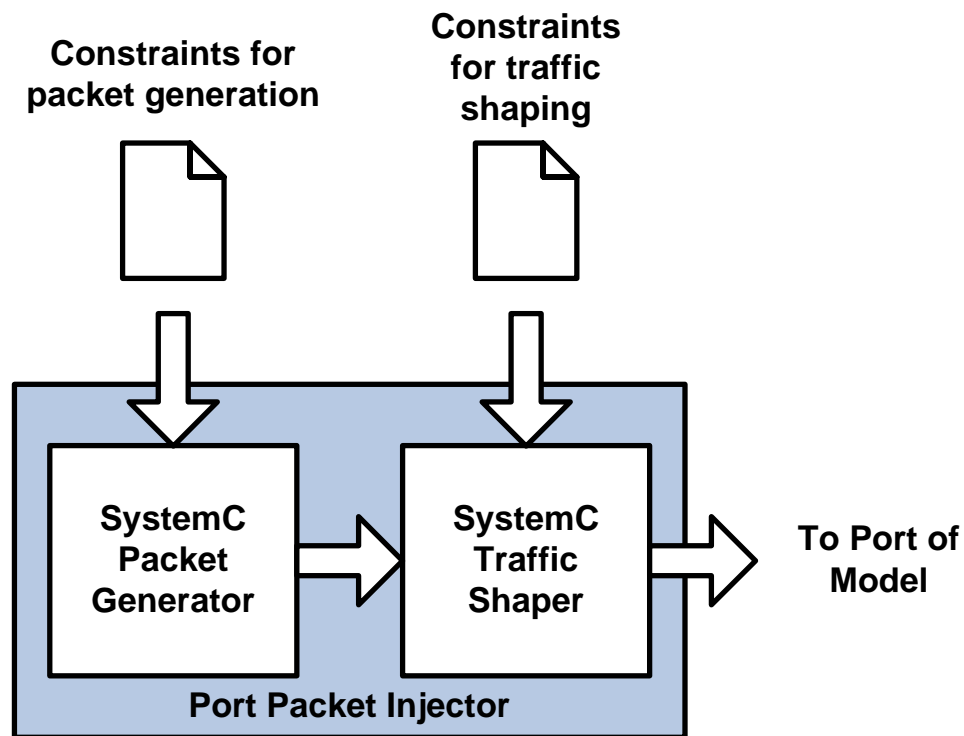
- Next Generation Serial RapidIO switch IP block
  - Virtual channels
  - Bandwidth reservation
  - Traffic management and fairness challenges
- Supporting multiple future products
  - Wide variety of target applications
  - Numerous key customer requirements to incorporate
  - Modular and scalable
- Beyond switching – supporting enhanced pre-processing functions
- Presently in design phase

## SystemC – Key Component 1: TLM

- Exhaustive architecture and algorithm analysis enabled by TLM simulation efficiency
  - All modeling was at the TLM level
- Complex customer specific application data patterns modeled
- Application expertise is directly integrated into the product specification
- Over 20X speed improvement compared to RTL level analysis
  - No license costs also helped things, too

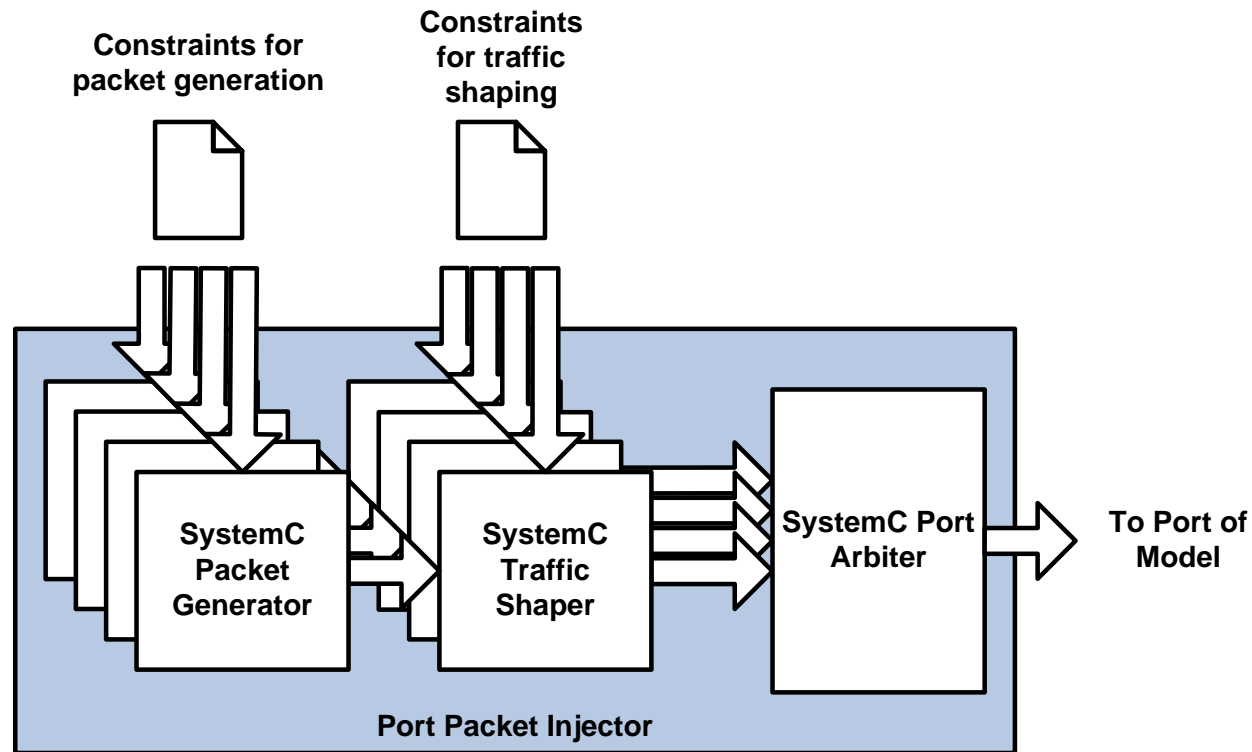
## SystemC – Key Component 2: SCV

- A critical tool for architecture analysis
  - Constrained random packet generators
  - Constraints passed by test file for efficient regressions
  - Control of seeds allowed for reproducible results and more accurate analysis

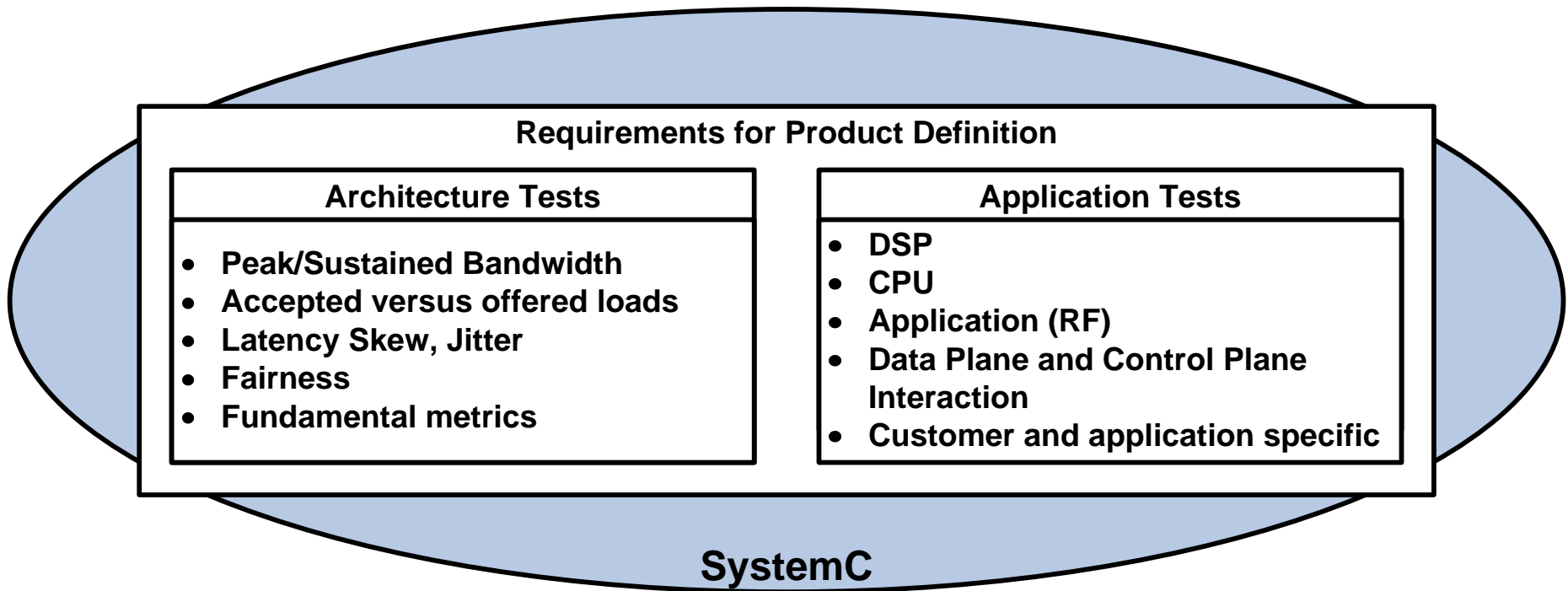


## SystemC – Key Component 3: Dynamic Processes

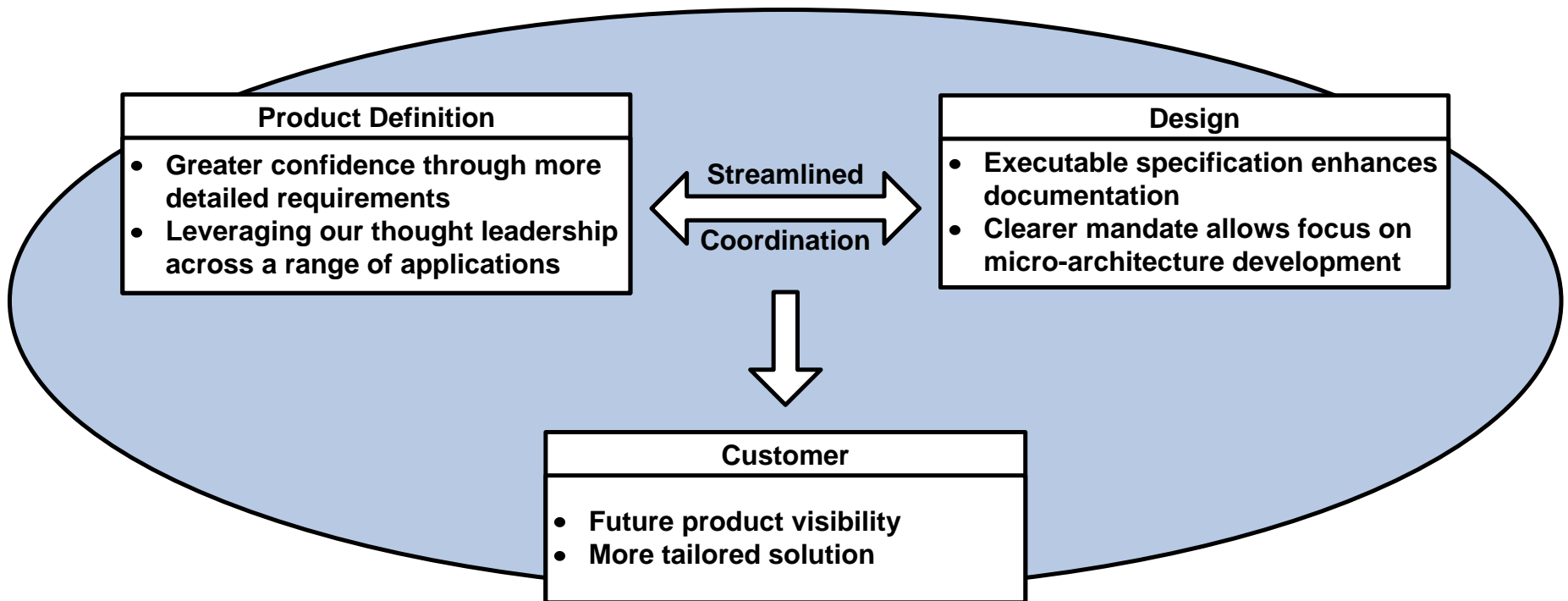
- Actual customer traffic tested
- Realistic traffic flows as produced by sources such as DSPs, CPUs and RF cards
- Dynamically spawned, parameterized modules enable complex packet injectors



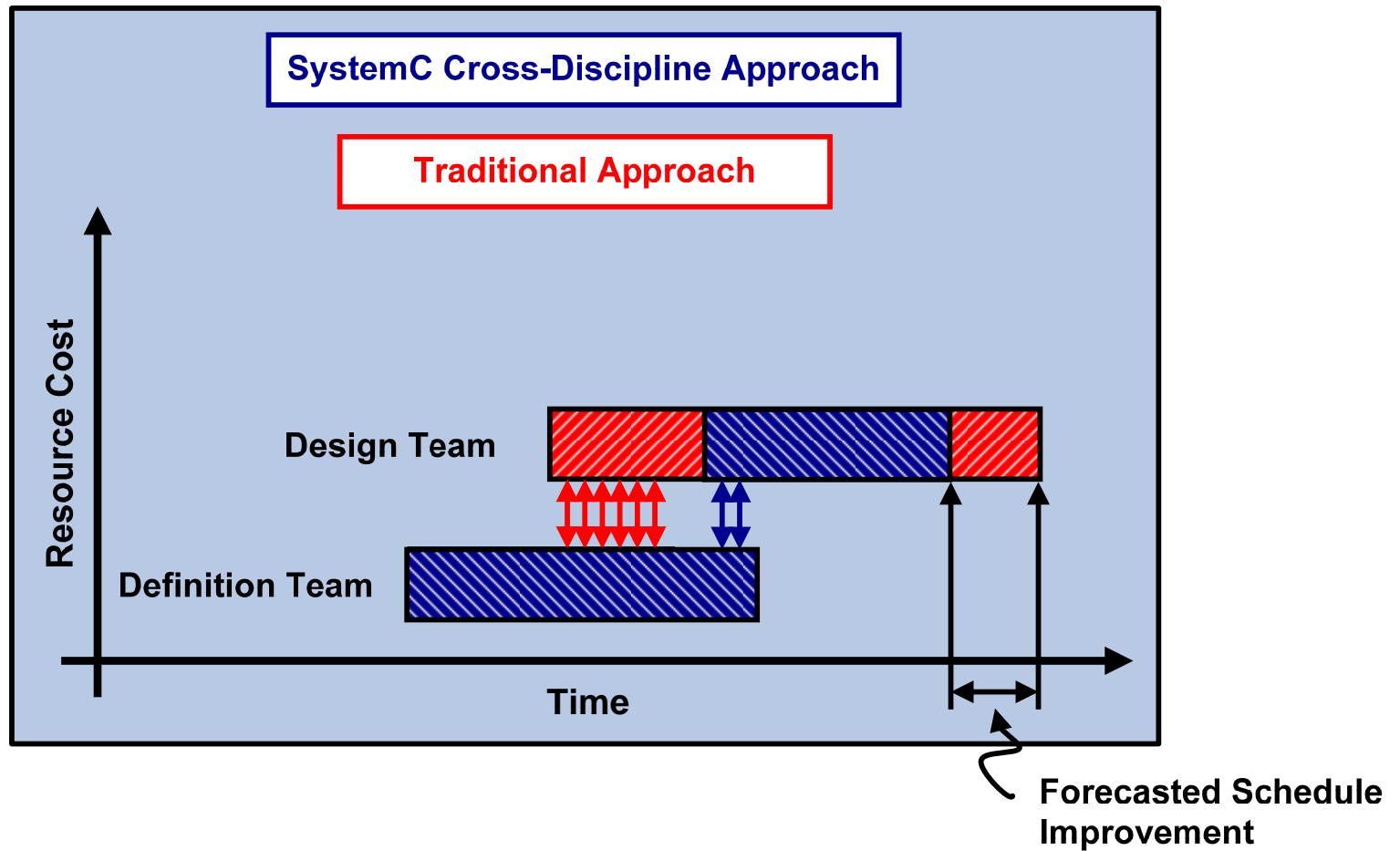
# SystemC – Supports all Requirements



## New Definition Process – Benefits all Parties



# New Definition Process – Benefits in Cost and Schedule



# Questions