CDG VALUE PROPOSITIONS

William Bricken
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ISSUE: Hardware design is costly, time-consuming, and difficult
SOLUTION: Pragmatic benefits provided by a unified tool model

- incremental design development
- faster time-to-market
- fewer, faster design iterations
- fewer design errors
- controlled trade-off of key design parameters
- cost savings and productivity gains
- preserves reliability of delivery schedules
- integrated verification prevents design change errors

ISSUE: Larger, new designs press current tools to their limits
SOLUTION: New synthesis capabilities

- new, more efficient model of logic functionality
- multilevel logic optimization
- path optimization
- partial simulation
- logic/interconnect trade-off
- small number of logic patterns give comprehensive design coverage
- integrated front-end back-end tools and model
- designs generated automatically to meet performance specifications

ISSUE: Synthesis and design iteration require equivalence checking
SOLUTION: Built-in formal verification and goal-directed logic synthesis

- redundancy removal
- reconvergent path removal
- false path identification
- automated test pattern generation
- automated test bench validation

ISSUE: Large designs are hard to manage and to modify
SOLUTION: Powerful abstraction tools for management of complexity

- identification and abstraction of recurrent functional elements
- bit-width abstraction
- library module identification and extraction
- parametric generator functions
- hierarchical partitioning
- control of critical path length
- retiming and register relocation
- design reuse and integration
- identification and isolation of essential components
- sequential/parallel decomposition
- branching and path explosion management
- structure sharing

ISSUE: Functional specification is hard to convert to hardware design
SOLUTION: Design space exploration tools guided by user goals

- time/space trade-off
- modular and localized design trade-offs
- datapath synthesis
- top-down and bottom-up design
- localized changes under parametric control
- fan-in and fan-out control
- pipelining

ISSUE: New tools require new skills
SOLUTION: Compatibility with standard design practices and toolchains

- standard HDL and netlist input
- netlist output at any design stage
- integrates with conventional tool chain whenever desired
- handles all types of logic with equal efficiency