FOREWORD

VHDL has been at the heart of electronic design productivity since initial ratification by the IEEE in 1987. For almost 15 years the electronic design automation industry has expanded the use of VHDL from initial concept of design documentation, to design implementation and functional verification. It can be said that VHDL fueled modern synthesis technology and enabled the development of ASIC semiconductor companies. The editions of Doug Perry's books have served as the authoritative source of practical information on the use of VHDL for users of the language around the world.

The use of VHDL has evolved and its importance increased as semiconductor devices dimensions have shrunk. Not more than 10 years ago it was common to mix designs described with schematics and VHDL. But as design complexity grew, the industry abandoned schematics in favor of the hardware description language only. The successive revisions of this book have always kept pace with the industry's evolving use of VHDL.

The fact that VHDL is adaptable is a tribute to its architecture. The industry has seen the use of VHDL's package structure to allow designers, electronic design automation companies and the semiconductor industry to experiment with new language concepts to ensure good design tool and data interoperability. When the associated data types found in the IEEE 1164 standard were ratified, it meant that design data interoperability was possible.

All of this was facilitated by industry backing in a consortium of systems, electronic design automation and semiconductor companies now known as Accellera.

And when the ASIC industry needed a standard way to convey gate-level design data and timing information in VHDL, one of Accellera's progenitors (VHDL International) sponsored the IEEE VHDL team to build a companion standard. The IEEE 1076.4 VITAL (VHDL Initiative Towards ASIC Libraries) was created and ratified as offers designers a single language flow from concept to gate-level signoff.

In the late '90s, the Verilog HDL and VHDL industry standards teams collaborated on the use of a common timing data such as IEEE 1497 SDF, set register transfer level (RTL) standards and more to improve design

methodologies and the external connections provided to the hardware description languages.

But from the beginning, the leadership of the VHDL community has assured open and internationally accredited standards for the electronic design engineering community. The legacy of this team's work continues to benefit the design community today as the benchmark by which one measures openness.

The design community continues to see benefits as the electronic design automation community continues to find new algorithms to work from VHDL design descriptions and related standards to again push designer productivity. And, as a new generation of designers of programmable logic devices move to the use of hardware description languages as the basis of their design methodology, there will be substantial growth in the number of VHDL users.

This new generation of electronic designers, along with the current designers of complex systems and ASICs, will find this book as invaluable as the first generation of VHDL users did with the first addition. Updated with current use of the standard, all will benefit from the years of use that have made the VHDL language the underpinning of successful electronic design.

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