

Software is making hardware easy...ware

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It's not uncommon to only think about the simple devices microcontroller enable. However, applications today are becoming more complex as consumers demand more from their products, driving several trends in the microcontroller industry. For example, applications are demanding more functionality in smaller form factors. In response, microcontrollers are becoming more integrated with modules that are typically found outside of the chip. More applications are also being driven by microcontrollers as opposed to larger, more power hungry processors. Ultimately, these trends mean the microcontroller user base is growing, many of which are brand new to microcontroller development. These new developers are being introduced to an industry of microcontroller portfolios with increased complexity and integration, creating a need for easy-to-use design tools and software solutions to help developers get started quickly. To understand the importance of software development tools specifically, let's consider what it is like being a new microcontroller developer in this data-rich environment.



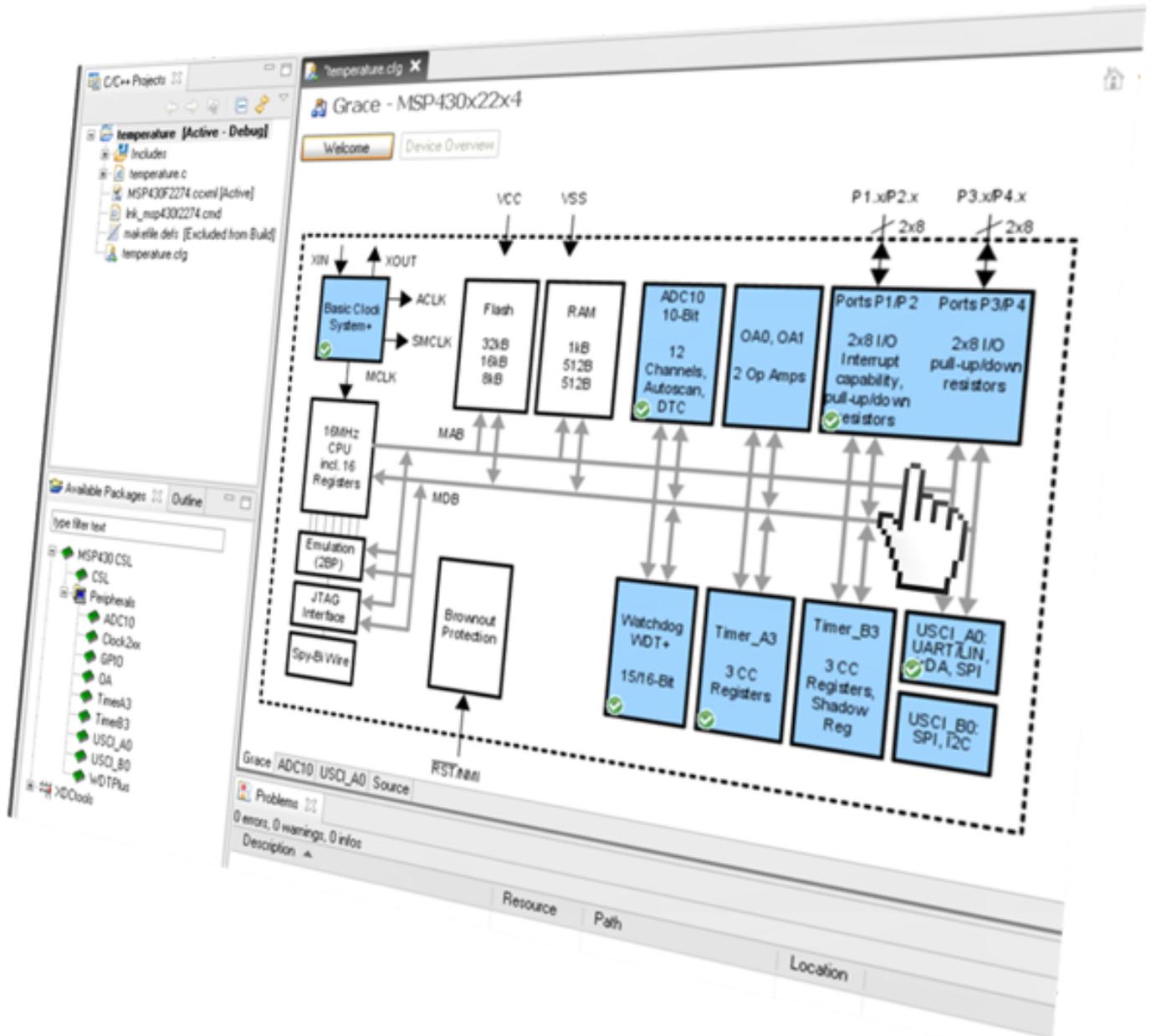
A new developer, perhaps a recent graduate or existing designer looking to make a switch in hardware, enters the industry and is bombarded with thousands of microcontroller options, each claiming to be the lowest power, lowest cost and with the highest performance. Each vendor also offers its own set of peripherals, package options, clocking sources and overall configuration complexity. With each vendor vying for the developer's attention, time and resources, software becomes a key differentiator.

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Software development tools enable vendors to think outside of the chip to provide customers an intuitive, non-intimidating way of learning how to use hardware solutions. For example, while vendors MCU A and MCU B may both have 10 channel, 12-bit analog-to-digital converters (ADCs) and a 16-bit timer, MCU A might have a complete software tool chest that helps a new developer start designing applications within minutes.

Through its software development tools, MCU A can truly differentiate how the developer learns about the hundreds of devices offered throughout its portfolio. Its software programs can guide the developer through the design process, offering tips on how to extract the most functionality and features from its devices. Interactive block diagrams can also explain the various integrated modules and peripherals within the microcontroller. Additionally, these software development tools can not only provide existing code, but actually generate dynamic code examples depending on the developer's specific requirements.



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Software-generated code has many benefits, as this code is completely tested and guaranteed to work on the vendor's microcontroller. In addition, this generated code follows proper coding convention for consistent layout and organization, and saves time by recycling code as much as possible rather than reinventing the wheel. This not only ensures consistency between projects, but allows the developer to focus on the differentiating aspects of his or her application.

Throughout the entire research and development process, software development tools play an integral role. With so many microcontroller options available today, it is important that we do not forget the software options available to efficiently and effectively leverage the integrated peripherals of these increasingly complex devices.

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