

The Inventor And The New Product Developer

New product developers have to figure out how to become better inventors

By Mike Rainone



“To make connections you have to get up and move.”

I have always avoided the term “inventor” just to keep an arms distance from the nutcase label – you can probably tell from my heavily doctored picture that it wouldn’t take much for me to slip into that category. When someone asks what I do, my short version (not my “elevator” speech) is that I am a new product developer. I create and develop new products by finding and applying new technology for big companies. Now I am going to drag us all down into the mire a bit and say that often, and at its best, NPD is in fact an act of invention. Even when a new product is simply an incremental improvement, in many cases the improvement warrants a patent. Does this sound familiar folks? The truth is, like many of you design engineers, I am an inventor.

The real question I want to explore – if explore is what I do in 1,000 words or less – is how we, as new product developers, can figure out how to become better inventors. But first, perhaps we should distinguish an inventor from a new product developer so we at least get the motivation in the right spot.

- 1) As new product developers, we are market driven, rather than technology driven – somebody tells us what problem they need solved and we solve it. We are not out there inventing for inventing sake ... mostly.
- 2) We have a discipline about the problem we are solving. We insist that the marketing folks carefully specify how the product should work, what it is meant to achieve, and what part of the competitor’s product they need us to work around. We always bear in mind Charles Kettering’s adage, “A problem well stated is a problem half solved.”
- 3) Our projects are funded by corporate NPD funds, not our kid’s college trust funds, and we are certainly not trying to fund our retirement with one big “hit.”
- 4) We are disciplined in our problem solving. We study competitive products, we examine patents, we search literature, we talk to other people, and we convene meeting after endless meeting in order to carefully lay the groundwork for that “Aha!” moment.

Filling Your Brains

The first three distinguishing characteristics are fairly obvious so I won’t discuss them here. It’s the actual discipline of problem solving that bears discussion. In order to facilitate creative invention (for NPD, not ego) we must focus on the preparation (refresher on the four steps of creativity: preparation, incubation, illumination and verification). There are two parts of preparation: problem specification – immersion in the articulation of the problem statement – and filling your brains – immersion in the possible solution space. Get the problem well defined so we know what we are working toward, then create a target-rich environment in our heads of possible solutions.

Let’s focus on “filling the brain.” My first step, not necessarily the best, is to start looking for patents, which helps study the competition. I look for what is being filed, and then I dig through the Internet. I talk to colleagues and, since I have no shame calling perfect strangers, I have no problem corraling the experts. Notice that all of the verbs in the last sentences are active? I am saying

that preparation requires you to get up and actively seek out solutions.

Back when I was a junior psychologist, Harry Harlow at the University of Wisconsin discovered that baby ducks had to follow Mom around to become “imprinted” on the duck species; otherwise they never made a correct connection between their own “duckness” and other ducks. Movement was the key. I think Harlow had it right, to make connections you have to get up and move.

To be truly creative, we must get “off our butts” and get away from our comfort zones by becoming actively engaged with the problem at hand. In doing so, we increase the possibility of a connection. Ultimately, that is where we arrive at the “illumination,” otherwise known as the “Aha!” moment. In that moment, we make the connection between our well-stated problem and the abundant richness of possible solutions with which we have now stuffed our brains.

But what’s the quickest and most effective way to stuff our brains to make connections and to move? I think that it’s through face-to-face interaction with new ideas and new technology. The best place to find new ideas is at a convention. If you are truly prepared and if you have a well-stated and understood problem, going to a convention is a terrific way to increase serendipity, to increase the random probability of a making an important connection.

Walking The Floor

I have personally solved more vexing problems by walking a convention floor and asking questions than by any other method. In doing so, I’ve learned that the most critical part of inventing for a specific problem is with a mind that is open to possibilities. You must be willing to explore the world outside your normal stomping grounds and question the things you thought you knew, but did not know well enough.

In my company, we have a process we call “enhanced serendipity” that directs the effort to fill the brain. It requires total immersion in a problem, and then immersion into possible solutions. We maintain a pool of subject matter experts. We maintain a database with thousands of cataloged solutions. We read hundreds of magazines each month to explore alternative arenas. We talk to experts in unrelated areas. We search hundreds of RSS feeds in dozens of field. And frequently, on a whim, we go into the prototype lab and build “duct tape” mock-ups to understand and test our theories. Finally, and most importantly, we GO to conventions. It is the simplest form of enhanced serendipity available, it is how the connections happen, and it is where out-of-the-box solutions often occur.

Now for a shameless ad: If you don’t belong to the PDMA, the Product Development and Management Association, I would suggest that as a design engineer involved in NPD you join. We need more engineers to balance the abundance of marketers involved, to represent the really tough part of the NPD equation: how to make their dreams work. If you are interested in my technology problem-solving approach, I will be teaching an all-day seminar as a follow-on to the PDMA national convention which starts September 13 in Orlando, FL. Information is available at <http://conference.pdma.org/MainConferenceAgenda.cfm>. PDD



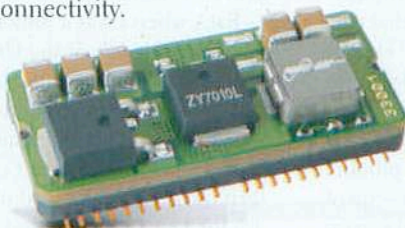
Prototyping & Production

Newark (Chicago, IL) has announced that it is now the exclusive North American distributor of UK-based manufacturer **Dataman** (Orange City, FL). Dataman's range of universal, specialized and gang programmers — that are designed for use with prototyping and production quantities of microcontrollers, memory chips and programmable logic devices (PLDS) — are now available.

Additional products include:

- Programmers, which can support USB 2.0 connectivity.
- In-system programming capabilities (ISP).
- PIC micro devices.

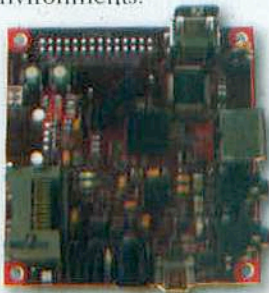
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Beagle Board

Passionate open source developers and hobbyists can now realize their creative design ideas without being restricted by hardware development tools, lackluster performance capabilities, high power consumption or stifled design environments.

Open platform innovators will now have the expandability of desktop machines as Digi-



Key Corp. (Thief River Falls, MN) announces that it is shipping the Beagle Board, which is a powerful, low-cost and fanless embedded development board smaller than a drink coaster, according to the company. The pocket-size, USB-powered Beagle Board is based on Texas Instruments' (TI) low power OMAP3530 applications processor, which features:

- An ARM® Cortex™-A8.
- A TMS320C64x+™ digital signal processor (DSP).
- The ability to run 1,200 Dhrystone million instructions per second (MIPS) for a full Linux operating system with desktop windows managers and office applications.
- An OpenGL® ES 2.0 compatible graphics engine to achieve photo-realistic, real-time pixel-shaded graphics for gaming and 3D user interface acceleration.

www.beagleboard.org

www.digikey.com

Power Management Solutions

Power-One (Camarillo, CA), a provider of power conversion and power management solutions has signed a global distribution agreement with **Mouser Electronics** (Mansfield, TX). Mouser will stock a variety of products including DC-DC converters and power supplies. Power-One designs and manufactures energy-efficient power conversion and power management solutions for application including:

- Alternative/renewable energy.
- Routers, data storage and servers.
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- Medical diagnostics.
- Railway controls.
- Semiconductor test equipment.

www.power-one.com

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EEPROM Family

Mouser Electronics (Mansfield, TX) is now

stocking the UNI/O™ Serial EEPROM Family from **Microchip Technology** (Chandler, AZ). The UNI/O™ devices are supported by the MPLAB® Starter Kit for Serial Memory Products and the MPLAB® PM3 Universal Device Programmer. The UNI/O™ Serial EEPROM devices are based on Microchip's patented UNI/O memory-device protocol. The devices feature:

- A single I/O EEPROM that can support any data rate from 10 to 100 kHz.
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