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THE RACE FOR A NEW GAME MACHINE

压力下的角逐

解密索尼PS3与微软Xbox 360的生死时速之战

戴维·希普

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◎著

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图书在版编目 (C I P) 数据

压力下的角逐:解密索尼 PS3 与微软 Xbox 360 的生死时速之战/(美)
希普,(美)菲普斯著;郑磊译.——南京:南京大学出版社,2010.1
ISBN 978-7-305-06493-7

I . 压… II . ①希…②菲…③郑… III . 长篇小说—美国—现代
IV . I712.45

中国版本图书馆 CIP 数据核字 (2009) 第 173112 号

THE RACE FOR A NEW GAME MACHINE by DAVID SHIPPY & MICKIE PHIPPS

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This edition arranged with KENSINGTON PUBLISHING CORP.

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江苏省版权局著作权合同登记 图字:10-2009-324 号

出 版 者 南京大学出版社
社 址 南京市汉口路 22 号 邮 编 210093
网 址 <http://www.NjupCo.com>
出 版 人 左 健

书 名 压力下的角逐:解密索尼 PS3 与微软 Xbox 360 的生死时速之战
The Race for A New Game Machine

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编辑热线 025-83232337

责任编辑 曹晓玉

照 排 南京新华丰制版有限公司
印 刷 扬中市印刷有限公司
开 本 787 × 1092 1/16 印张 15.25 字数 238 千
版 次 2010 年 1 月第 1 版 2010 年 1 月第 1 次印刷
ISBN 978-7-305-06493-7
定 价 34.00 元

发行热线 025-83232319

电子邮箱 Press@NjupCo.com

Sales@NjupCo.com (市场部)

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中文版自序 | THE RACE FOR A NEW GAME MACHINE

《压力下的角逐——解密索尼PS3与微软Xbox 360的生死时速之战》这本书讲述了制造当前最热门的游戏机芯片的幕后故事。它介绍了芯片制造业的高压工作环境、绝密的工作内容以及激烈的行业竞争，但是我们的故事主要是关于人的，即那些才华横溢又不失可爱的工程师们。他们生活在芯片设计这一大多数人都知之甚少的高科技世界。本书将着重介绍这一有趣的工作，目的是让人们了解这项复杂的科学技术，不再对它望而生畏。我们想要让电脑芯片的设计变得不再神秘，并且可能启发一些年轻的工程师沿着这条路走下去。同时我们也想与大家分享如何运用领导能力渡过困境的经验。

虽然故事发生在2001年至2005年德克萨斯州的奥斯汀，但是全世界不同阶层的人们都将从中永久获益。我们介绍的领导观念、我们在管理方面的奋斗、我们对团队的严格要求和所有大型项目的情况差别不大。任何一个公司都知道，创新和创造力是每一家公司的生命。这是个鼓舞人心的故事，令人惊讶的多元文化的全球设计团队为Xbox 360和PlayStation 3游戏机注入了鲜活的生命力。

这些工作中新奇有趣的冒险已引起了包括玩家、科技人员、商业行政人员、电脑爱好者等人的极大兴趣。希望你们也会喜欢这个故事。

向亲爱的中国读者致敬！

戴维·希普 米基·菲普斯

To Our Chinese Readers

THE RACE FOR A
NEW GAME MACHINE

The Race for a New Game Machine – Creating the Chips Inside the Xbox 360 & the PlayStation 3 tells the behind-the-scenes story of the making of the microprocessor chips for the world's hottest game consoles. We reveal a pressure-cooker work environment, top secret work, and cutthroat competition, but our story is primarily about the people, those brilliant and interesting engineers who live in the high-tech world of chip design, an environment foreign to most people. This book shines a bright light on this fascinating work. Our goal was to let people see through the scientific mumbo-jumbo that scares them away from technology. We wanted to demystify computer chip design and maybe inspire a few budding engineers along the way. We also wanted to share some of the leadership lessons we applied during this trial-by-fire experience.

Although the setting was Austin, Texas, and the events took place between 2001 and 2005, there is a certain timeless, global appeal to this story for people from many different walks of life. The leadership concepts we introduced, the managerial battles we fought, and the demands we levied on our teams are not so different from those found within any large project. As anyone in the workforce knows, innovation and creativity are the lifeblood of every company. This is the inspiring story of the amazing multi-cultural, worldwide design team that breathed life into the Xbox 360 and PlayStation 3 game consoles.

This enduring work-place adventure has already sparked the interest of a broad range of readers: gamers, techies, business executives, computer geeks, and avid readers of non-fiction narrative. We hope you too will enjoy our story!

Sincerely,

David Shippy and Mickie Phipps

当我们坐下来写这本书的时候，我们就知道我们将告诉广大的读者一个独一无二的精彩故事。异常紧迫的时间表、顶级秘密任务分工、激情洋溢的员工们、刚愎自用的领导和有竞争关系的两大客户，这些因素加在一起构成了一个在美国任何一家企业都会有的高压工作环境。任何一个员工都与书中的这个故事有牵连。这是关于人和团队的故事，是他们创造了独一无二的高利润产品——Xbox 360 和 PS 3 游戏机芯片。这不是对高科技的无稽之谈，而是一个关于一群碰巧制造这些微芯片的人的真实故事。

索尼、东芝、IBM (STI) 联盟的倡导者们将行业中的芯片制造佼佼者们融到了一起，开创了家庭娱乐行业的新纪元。他们从德克萨斯州、德国、纽约、北加利福尼亚和明尼苏达州调集了 IBM 的芯片设计精英，并吸纳来自顶尖大学，如普渡大学等的一些刚毕业的大学生以必要的补充力量。此外，还有来自索尼和东芝的曾参与设计 PS 2 的顶尖工程师。他们推动了技术前沿，远超人们所能想象到的程度。他们成功地设计出了世界上运行速度最快的微处理器——微软的 Xbox 360 和索尼的 PS 3 游戏机的大脑。

为 Xbox 360 和 PS 3 设计芯片是一次惊心动魄的经历，经历中不乏易怒的行政高管、精神高度紧张的工程师们和几乎不可能完成的最后期限。但这也是一次值得的经历。成为这个团队的一员，我们很幸运。当我们超越了我们的目

标，或者一位工程师超水平完成了我们所指派的任务，或者当我们的上司们对我们的工作给予夸奖时，我们备受鼓舞。当我们的团队在规定的期限内制造出世界上最快的芯片时，我们最终觉得这期间所经受的一切苦难都是值得的！

经历了这个项目后，我们从自己的成功经验中获得了很多东西，但是，有时候，更多更重要的经验教训来自我们所犯下的错误。在历经了血、泪、汗的洗礼后，成功是如此地甜蜜。我们学到了并且应用了这些重要的生活原则，这些原则曾帮助我们的团队获得成功，现在也让我们一直获益。我们相信，我们的团队能够按照时间表完成项目目标，尽管几经挫折，我们仍深信不疑。我们也证实了，“我能”的态度是有感染力的！

在我们的书中，我们重点列举了一些重要的领导策略，那些是我们在成功完成项目后的感悟。以下是这些经验教训的核心摘要。

1. 鼓励大胆的设想

在每一个成功的技术成果的中心，都存在着一个大胆的构想，它鼓舞着团队。将深厚、持久的激情和非凡的专业知识结合起来，你就拥有了大胆构想的资本。很幸运，我们的团队中不止一位成员拥有这些非凡的品质，正是他们勇于挑战的伟大梦想使我们的团队更加努力地工作。我们被充满无限可能的未来鼓舞着。

先知们激励着我们表现良好的团队去创造、去冒险，专注于我们的目标。当我们的构想正确就会得到奖励，而我们的失策也会带来不幸。制定一个有可能完成的里程碑和明确的界限就可以预测到未来。就是这么神奇，这就是路线图。在沿着这张地图行走的途中，如果你必须要这么做的话，可以修改地图，但是你要知道，这张地图在创造工作，也在提供混乱的机会。最好在起点处就做出正确的决定，只要计划被一再斟酌、磨练过，哪怕开始的时间有些延误也没关系——尽量减少变化带来的影响。

2. 建立一个成功的团队

建立成功团队的第一步就是要招聘高级人才和拥有真正领导能力的人作为种子选手。接下来就是要组织各种学科能人和领导者，以最大化成功几率。STI团队就是高度多样化，且拥有一批将他们大部分的时间用来创造 Xbox 360 和 PS 3

游戏机芯片的能人工程师。但是，将这个团队的人聚集到一起并不是一个偶然或者是巧合。这是经理和技术领导人共同努力的成果，他们知道组建团队只是一个开始。我们曾不断重视技能和个性的结合，调整分配结构，提高熟练程度，并使人不断提高自己的能力、表现。这需要绝对地专注和坚持。

团队动力学机制复杂而又难以捉摸，且充满了欺骗。有很多谚语——“一粒老鼠屎坏了一锅粥”，“油水不相容”，又亦或是“链子的强度取决于最薄弱的那段”都是如此地真实！将一帮天才们集中到一个项目中并不能保证成功，除非他们之间能认同彼此。通过正确权衡好团队中成员的技能和个性来最小化冲突、最大化追求卓越的欲望。人们通常在自己喜欢的或是尊敬的人身边工作时工作状态最佳，而且一般来说，重新创建一个完美的团队要比协调一个已经存在的团队容易得多。你对个人的技能方面花了多少心思，对团队力你也至少得花同样的心思。

3. 了解你的竞争力，做一些功课

激励我们更优秀、从而拥有更多机会的就是竞争力。对竞争能力的准确评估有助于我们为宏伟大计制定目标范围。我们得确保自己已跳得足够地高。

在这个故事中的每一个角色——索尼、东芝、IBM 和微软都得参加不同的比赛，去打败不同的对手。他们不一样的竞争力度和所要达到的成果有助于我们制定项目目标。

对付那些想要分享你的市场份额的竞争对手，必须得对他们知根知底，它的作用是无可替代的。要细致地评估对手，得花时间、运用知识和工作能力，但最终你会有回报的：在市场中可以更快地应对市场的变化。你的产品将会具备消费者想要的产品特征，你也一定会得到超预期的结果。应对新一代产品挑战的唯一方法就是做功课——研究过去，分析市场，进行整体调研并且从前人所犯的错误中吸取教训。倾听团队的声音，运用他们从工作中得来的知识。

4. 激励创新

要不是依靠创新的翅膀，我们是不可能达到如此高的芯片设计目标的。没有人做过我们计划要去做的事。与一般人的想法不同，创新的思流不会像打开

龙头就会自动流出来那么简单。激励来自于解决问题的挑战。你得循循善诱地引导出新奇的想法，然后仔细解剖、分析它们。这项工作需要拥有熟练技巧和专业知识的教练和不怕挫折的发明者。

我们过去所做过的事情中没有一样能满足完成我们伟大构想所需要的条件。创新是，而且一直都是确保成功的神奇种子。

5. 能玩会干

芯片设计是一项让人精疲力竭、高度紧张且异常复杂的工作，如果我们没有一种不断提振士气的方法，我们将不可能坚持到最后。我们的消遣时间强化了成员间的关系，那些无价的无形资产促使我们每天都想去上班。我们的庆祝会让我们的成果得以显示在聚光灯下，让我们意识到我们自己的进步。我们觉得自己就是个获胜者。

努力工作以取得最后的胜利，尽情地娱乐以放松心情、保持清醒的头脑。没人能比同事们更了解日复一日地坚持需要多么艰辛地努力。

6. 敢于冒险

来自成功的满足感，确信我们正在沿着正确的路线前进，以及从工程师和领导层那里得到的力量和支持，有了这些，我们相信我们是不可战胜的。我们会带着一个新奇的想法行动起来，挑战过时的技术，或者承诺一个几乎不可能完成的时间表。我们肩并肩地站着，信念坚定地向前迈步，因为我们肩负领导层的信任，这种信任就像是给我们安装上了翅膀一样。

承担风险迫使我们专注未来，跨出下一个大步。我们大跨步地开始了创新历程。因为万事都是相对的，所以请记住，每件事都是有风险的，然而，每个风险都是一个机会。

7. 要乐观，即使处于争论的漩涡中

当然，“所向无敌”的轮子在往前开进的过程中不可避免地需要经受现实的检验。我们的工作量相当庞大，但给我们的时间却很有限，很多双眼睛都在注视着我们。保持乐观的心态能让我们始终专注于我们所期望的结果，即便是我们被那些说三道四的人引诱想要投降的时候，我们也不会轻易放弃。

不满的情绪可以像疾病一样传播开并摧毁团队坚持不懈的意志。在创新进程中错误产生了，分歧也就跟着来了。领导者的工作就是从争议中找出闪光点，并将它们重新组合成一个有现实积极意义的成果。

8. 保持速度

当时间成为关键因素的时候，快速决断才能成功。相信你的直觉，减少在决定上的争议。一个充分的讨论需要较长时间才能达成共识，改进计划。但是当让团队继续推进项目的进程更加重要的时候，领导者得认识到每个项目的关键时刻，加以控制。

9. 要具有前瞻性，要能预见问题，让人人都有责任心

在设计工程过程中，有两种问题：一种是复杂的谜团，需要激发工程师的创新方法解决；另一种是会淹没工程师的创新精神的错误。谜团问题就是我们为什么喜欢工程设计的原因——我们喜欢将自己沉浸在追求答案中。但是其他的问题，那些潜在的、本可以避免的问题出现在我们面前，非常令人恼火。作为一个领导者，提前预料出那些恼人的问题是一种艺术形式。这得需要经验、预见性和对团队的深入了解，了解团队的技术以及你得去满足的团队成員的要求是什么。惊喜对项目有利，所以要有前瞻性，在问题变得失控之前就预料到这个棘手的问题。

10. 庆祝成功

抓住每一个机会庆祝成功，即使你并不喜欢这样，即使你很累，已经精疲力竭了，即使这个成果更多的是因为运气好而不是因为技术过硬的关系。在庆祝会上投入些，精力充沛些，还要富有创造力，让你的团队看到你真心地赞赏，让你的发言激发团队新一轮的活力和激情。

创造一个好的庆祝环境，你的团队会对此叫好的。每一个成功都得庆祝，不管这个成功是多么小的一个。尽管最后你得为你们所吃的食物付钱，但是鼓励不会花太多的钱，而它的作用却会很持久。你的预算应该得包括奖励那些创造出现实利益的、表现良好的员工们。

11. 预先计划，坚持不懈，要有耐心

计划、坚持和耐心——这三个P打头的词是在高科技世界里生存的法则。预先考虑好，倾听来自你团队的声音，做好你该做的功课并且运用好信息来开展最好的计划。告诉你的团队，你乐意在最初时花时间和精力确定好正确的方向，他们也会为之而尊敬你，会追随你的步伐。当遇到困境时，不要放弃。每一项工作都具有挑战，每一个挑战都会提供一个让你跨越的机会。深吸一口气，然后继续前行。

我们写这本书，部分是因为我们想吸引那些敢在这样一个时间表上进行创新的聪明与勇气兼具的科技男女们的注意力。如果我们能激发一些坚韧的青年学生来挑战这项工程事业，并最终可以在自己设计的破纪录的芯片上用手指灵活地操作，那么我们才可以说，我们成功了。也许我们还能够拿着手电筒给一些其他的领导者照着他们的科技项目之路，希望他们能在这条路上避开一些障碍物。然而，即便我们所做的只是用这个有趣的故事给读者们带来欢乐，我们也就知足了。

戴维·希普 米基·菲普斯

LEADERSHIP FOR SUCCESS | FOREWORDS

When we sat down to write our book, *The Race for a New Game Machine*, we knew we had a unique story to tell that would appeal to a broad range of readers. The combination of a brutal schedule, top-secret assignments, passionate workers, domineering leaders, and competing clients made for a pressure-cooker work environment that could have been created in any industry in the United States. Everyone in the workforce can relate to the story in this book. It's about the people, the team behind the unique, high-profile products we developed — the chips for the Xbox 360 and the PlayStation 3. It's not a bunch of high-tech mumbo-jumbo, but is instead a story about the people who happen to make microchips.

The founders of the Sony/Toshiba/IBM (STI) Design Center took a melting pot of the best chip-making talent in the business and revolutionized the home entertainment industry. They enlisted the smartest IBM chip veterans from Texas, Germany, New York, North Carolina, and Minnesota, beefed up that team with young hotshot grads from top universities like Duke and Purdue, and then added the best PlayStation 2 engineers from Sony and Toshiba. They were hot, and they pushed the leading edge of technology farther than anybody dared to hope. They successfully designed the fastest microprocessors in the world, the brains of both the Microsoft Xbox 360 and the Sony PlayStation 3.

Designing the chips for the Xbox 360 and the PlayStation 3 was a harrowing experience, filled with hot tempered executives, stressed-out engineers, and impossible deadlines. But it was also extremely rewarding, and we were fortunate to be a part of it. When our team exceeded the goals, or when an engineer grew into the stretch role we'd assigned to him or her, or when our bosses — and they were legions — gave praise for the job we'd done, we were encouraged. And when our team delivered the fastest chips in the world on schedule, we finally felt it had been worth all the pain.

Throughout this project, we got lots of things right, but sometimes the most significant lessons came from our mistakes. Success is so much sweeter when achieved through a little blood, lots of sweat and even a few tears. We learned and applied important life principles that helped us succeed as a team and that help us still today. We believed our team could meet the project goals and schedule, and in spite of many setbacks, we never stopped believing in them. And they proved us right. A can-do attitude is contagious.

In our book, we highlighted the most important leadership strategies that, partly only in hind-sight, we know made our project successful. The excerpts and paraphrasing below capture the essence of those lessons.

1. Inspire A Bold Vision

At the heart of every successful technical accomplishment, there first existed a bold vision that inspired the team. Combine a deep and abiding passion with a vivid imagination and extraordinary expertise, and you have the makings of a visionary. We were fortunate to have more than one of those rare individuals on the Xbox 360 & PlayStation 3 project, and it was their grand dreams of challenge and glory that enticed our teams to work harder than ever. We were energized by a future lined with possibilities we had never before imagined.

These prophets inspired our high-performance team to create, to take risks, and to stay focused on the goal. The rewards that fell into our laps when we got that vision thing right, and the misfortune that befell us when we got it wrong, taught us how crucial that first step really is. Building the right plan with achievable milestones and realistic boundaries is kind of like divining the future. It's that powerful. It's the map.

Revise the map as you go along if you must, but realize that it creates work and the opportunity for confusion. Better to start right — even delay the start until the plan is honed — to minimize the effects of change.

2. Build A Team For Success

The first step to building a highly successful team is to recruit top talent and seed the team with true leaders. The next step is to organize the various disciplines and leaders to maximize success. The STI team was highly diverse and full of talented engineers who devoted a big chunk of their lives to creating the chips for the Xbox 360 and PlayStation 3 game consoles. But it was not chance or coincidence that brought this phenomenal group together. It took a concerted effort of managers and

technical leaders who understood that assembling the team was only the beginning. We gave constant attention to the mix of skills and personalities, tweaking assignments, building proficiency, and shuffling people to optimize performance. It took absolute focus and die-hard persistence.

Team dynamics are tricky, slippery, and full of treachery. All the old adages — one bad apple can spoil the whole basket, oil and water don't mix, or the chain is only as strong as its weakest link — are so true! Putting a bunch of geniuses together to work on the same project will not guarantee success unless some level of agreeableness and acceptance exists between them. Minimize turmoil and maximize the desire to excel by carefully juxtaposing the right skills and personalities on your team. People work best around people they like and respect, and it's often easier to create that perfect mix from scratch than to correct an imbalance in an existing team. Pay at least as much attention to the team dynamics as you do to the individual skills. Work very hard to make the right choices up front.

3. Know Your Competition And Do Your Homework

It is competition that drives us to higher levels of excellence and, therefore, to more opportunity. An accurate assessment of our competition's capabilities is what enables us to refine the boundaries of our bold vision. We must make sure we shoot high enough.

Each player in this saga — Sony, Toshiba, IBM, and Microsoft — had a different race to run, a different set of rivals to beat. The strengths and accomplishments of the competition, as varied as it was, helped shape our project goals.

There's no substitute for an accurate understanding of the rivals who seek to sweep your market share into their own bucket. It takes time, knowledge and work to create a thorough assessment, but in the end, you'll respond faster to changes in the market. Your product will have those winning characteristics that your customers want, and you'll be more likely to overachieve than to miss the mark. The only way to be prepared for the unique challenges of the next generation product is to do the homework — study the past, analyze the market, research the entire scope of the problem, and learn from the mistakes of your predecessors. Listen to your team and utilize the knowledge they've gained throughout their own careers.

4. Inspire Innovation

We couldn't have reached those lofty chip-design goals without flying there

on the wings of invention. No one had ever done the things we set out to do, and contrary to popular belief, creative juices don't just flow from a spigot with an on/off knob. Inspiration comes from the challenge of solving problems. You have to coax novel ideas into the light, then carefully dissect and analyze them. It takes a coach with finesse and expertise, and an inventor with thick skin.

Nothing we have done in the past is sufficient for what we need now to fulfill the grand vision. Innovation is and always will be the magic bullet that insures our success.

5. Work Hard, Play Hard

Chip design is exhausting, intense, complicated work, and we couldn't survive it without a way to re-energize. Our playtime reinforced interpersonal relationships, those priceless intangibles that made us want to come to work every day. Our celebrations put a spotlight on our accomplishments and helped us recognize real progress. It made us feel like winners.

Work hard enough to win, play hard enough to stay sane. No one understands better than co-workers the extraordinary effort it takes to persevere day after day.

6. Enable Risk Taking

The satisfaction that came from winning, the certainty we were on the right path, and the strength and support we gained from our fellow engineers and leaders —with these things, we believed we were invincible. We could step out on a limb with a new idea, challenge an outdated technological truism, or commit to a near impossible schedule. We stood side-by-side and stepped out in faith, emboldened by the trust of our leaders draped across our shoulders like wings.

Risk-taking forces us to focus on the future, to take that next big step. It jump-starts the creative process. And while it's all relative, remember that everything's a risk. And every risk is an opportunity.

7. Stay Positive, Even In The Swirl of Controversy

Of course, on the heels of invincibility comes the inevitable reality check. We had a huge plate load of work, very little time to do it, and many eyes watching us. Staying positive kept our focus on the desired results, even when it was so tempting to surrender to the nay-sayers.

Discontent can spread like a disease and destroy a team's will to persevere. Mistakes occur in the natural course of the creative process, and disagreements arise. The leader's job is to take the nuggets revealed through that controversy and piece them together into a realistic positive outcome.

8. Keep Up The Pace

When time is of the essence, success demands fast decisions. Move on to the next problem. Trust your instincts. Limit debate on the decision. There's a time and place for extended discussion, efforts to reach consensus, and refinement of the plan, but a leader has to recognize those critical times in every project when it's far more important to keep the team moving. Take control.

9. Be Proactive, Anticipate Problems, Hold Everyone Accountable

There are two kinds of problems in the engineering process: the complex puzzles that demand innovative solutions and entice the best from an engineer, and the blunders that drown the engineer's creative spirit. The puzzle problems are why we love engineering — we enjoy taxing our brains in pursuit of answers. But the other problems, those potentially avoidable errors that punch us in the face, are very irritating. For a leader, anticipating those nasty problems before they occur is an art form. It takes experience, foresight, and a deep understanding of the team, their skills, and the requirements you're trying to meet. Surprises can crater a project, so be proactive and anticipate the tough problems before they spiral out of control.

10. Celebrate Success

Take every opportunity to celebrate success. Even when you don't feel like it. Even when you're tired and stressed out. Even when the accomplishment seems to be more the result of luck than skill. Put thought and energy into your celebrations. Be creative. Let your team see the sincerity in your praise. Let your words ignite a new spark of energy and vitality in the team.

Make it a rewarding environment, and your team will respond. Celebrate every success, no matter how small. Encouragement doesn't cost much and it can go a long way, even though eventually you'll have to put your money where your mouth is. Your budget should always include delivery of tangible benefits for performance.

11. Plan Ahead, Be Persistent, and Be Patient

Planning, persistence, and patience — the three P's of survival in the high-tech world. Think ahead, listen to your team, do your homework, and use that information to develop the best plan. Show your team you are willing to invest the time and energy to get it right the first time, and they'll respect you for it. They'll follow you. Don't give up when things get rough. Every job has its challenges, and every challenge provides an opportunity to rise above it. Take a deep breath, and keep moving forward.

We wrote this book, in part, because we wanted to draw attention to those smart, courageous people who work in technology, those men and women who dare to invent on a schedule. If we can inspire some tough, young students to pursue a challenging career of engineering just so they can eventually wrap their fingers around a break-through chip they designed, then we can count ourselves successful. Perhaps we can also hold the flashlight and point the way for some other leaders of technical projects, hopefully helping them avoid some bumps along the way. But even if all we have done is entertain our readers with an interesting story of human toil in the workplace, we are happy.

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