

2009年度输出版权优秀图书奖

[西班牙] 乔迪·米拉 温为才 周明宇 著

Jordi Milà & Stone Wen & Zhou Mingyu

TOP EUROPEAN DESIGNERS' SKETCHES ON THE INNOVATION PROCESS (2nd edition)

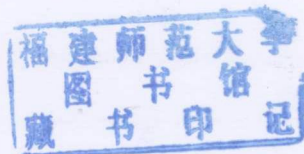
欧洲设计大师之创意草图 (第2版)

 北京理工大学出版社
BEIJING INSTITUTE OF TECHNOLOGY PRESS

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preface

When time goes by in the 21 century, China will face a developing barrier since China relies on materials and labor at a low price. China has to change the mode of development, in which industrial design as a major part of industry innovation must play an important role in this change. In 2007 premier Wenjiabao authorized a government regulation: "China must pay a lot of attention to the industrial design." From this point, China is now going on a developing road which is guided by industrial design.

Now, compared with the European design, China's industrial design is not developed. China design education and design field needs to exchange with top European design studios and top designers more widely and deep. Our design principle also needs to exchange with European design principle. In order to broaden Chinese design students' horizon and let Chinese design field know the design process and design status in European design studios, BITP invited my student Stone Wen and his good friend Jordi Milà to write this book about the sketches in the design processes.

Jordi Milà is a famous designer in Europe. He is the owner and the general manager of the top European design studio—EDDA. In EDDA, there are about 60 top designers and engineers and a lot of Hi-tech production equipment. The design level and quality are one of the best in Europe. Especially, in terms of transporting tools and medical equipment design, EDDA is above the all in Europe. EDDA has designed several

thousand products for many international companies including Sony, HP, Honda and Suzuki and so on. Stone obtained his master degree in Industrial Design from BIT. Now, he's a lecturer with practical experiences at Wuyi University. He once worked in Giant Company and Logitech Company. Stone Wen has designed a lot of successful products for Arcoelectric UK, Bulging UK, and Vestfost Denmark. This book is written by two designers with different nationalities and cultures. I am really glad to see this book.

All the sketches selected in the book are from real projects. They show the whole design process including the product values analysis, design philosophy, design concept, product details design and product launch. The most valuable point of the book is that it shows the top designers' design processes which is unknown by others. I think it's a very instructive and practical book. I also believe, the younger students and designers can learn a lot from this book through reading it carefully.

The sketches are great and the explanations are also precise and wonderful in this book. The layout design is from a talented designer Virginia Sorlino, her layout design is really impressive. I believe this book will help the younger designers and the design students to improve the innovative abilities and bring something different to Chinese design field.

Written in Art&Design Dpt. BIT
Professor Zhangnairen

进入21世纪以来，“世界工厂”——中国面临着发展的瓶颈。中国必须改变现有这种依靠出卖廉价原材料和劳动力的工业发展模式。工业设计作为企业创新的主要动力，应该也必须在这种工业发展模式的转型中扮演重要的角色。2007年，温家宝总理做出重要批示：“要高度重视工业设计。”中国正踏上一条以工业设计为导向的自主创新之路。

目前国内的工业设计水平同西方国家的设计水平相比，仍有较大差距。中国设计教育界及业界需要和世界著名团队及设计大师进行更全面、更深入的交流和思维碰撞。为了让华夏莘莘学子及设计师开阔视野，让中国设计界了解欧洲顶级设计事务所的设计创意过程及设计现状，北京理工大学出版社邀请了我的学生温为才和他的好友乔迪·米拉合著了这本有关创意草图及创意过程的书。

乔迪·米拉为欧洲著名设计师，是欧洲著名设计事务所EDDA的创始人兼总经理。EDDA有60多名专业设计人员及各类高科技的生产设备，其设计能力在欧洲名列前茅，特别在医疗产品及交通工具设计方面出类拔萃。EDDA已为数百家国际著名企业成功开发了数千款产品，其客户包括惠普、索尼、本田和铃木等。EDDA屡获世界设计大奖，仅在2007年，就获两项欧洲“红点”设计大奖。温为才是北京理工大学工

业设计专业硕士毕业生，是一位拥有深厚工业设计实践经验的讲师。曾任职于Giant，Legitech等世界知名企业，并为英国Arcoelectric，Bulging，丹麦Vestforst等公司开发了多款产品，并受到了好评。现任教于五邑大学工业设计系。看到这两位来自不同国籍、不同文化背景的设计师联袂打造出这本设计佳作，我甚感欣慰。

书中草图都选自实际开发的成功项目，并且全流程向读者展现产品从无到有的过程，包括产品价值分析、设计理念、方案构思、产品细节设计、产品的市场投放。该书的精彩之处在于，它向读者展现了设计大师背后不为人知的创造过程，具有非常强的实践指导性！通过对这些创意草图及实际案例的仔细研究，我相信年轻设计师定会受益良多！

该书“图图精彩、字字精到”，处处体现了设计大师敏锐的洞察力。本书的版面设计出自西班牙非常有才华的设计师Virginia Sorlino之手，其设计也非常精美别致。希望这本不可多得的设计佳作的出版能为广大年轻学子及设计师打开创新之窗，为中国的设计界带来新气象。

张乃仁 教授
北京理工大学艺术设计学院

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introduction

Open an innovative window in your mind through this book

My good Spanish friend Alfonso Carreras introduced Jordi Milà to me five years ago. Jordi is one of the best designers in Europe and he owns one of Europe's top design studios—EDDA DESIGN. Throughout his career Jordi has won a range of highly regarded design prizes, including quite a few red dot prizes in recent years. Till now Jordi has given to my design students two fascinating lectures, which were actually two most successful and instructive lectures the students have ever had the pleasure to attend. My acquaintance with Jordi has benefited me a lot. I have began to understand Jordi's theories on design, and I was astonished by his design work, so I eagerly wanted to know the innovative processes involved in these amazing designs. For a designer, the main communicative tool is the sketch. The innovation, ideas and processes are expressed in the sketches.

In order to meet the young students' study desire, I decided to invite Jordi to write a book about the sketches in the innovative process with me. In the book, there are four parts. In the first part we look at the philosophy of design in order to understand design more deeply. In the second part, we examine the skills of expression. Through studying these materials we will be able to express our ideas more clearly. The third part illustrates a series of successful projects; it shows us the innovative processes through the sketch. It is the best way to understand Jordi's design philosophy and learn from Jordi Milà as well. In the final part we can see some wonderful design works from EDDA DESIGN studio which will help both students and designers broaden their horizons. The sketches selected from the real projects in the book are very practical and instructive; some of the sketches have never been in public before. It is a wonderful opportunity to get to know the innovative process of one of the world's top design studios so fully and deeply through their sketches and designs. I hope this book will help students and designers to understand what real design and innovation is, as well as providing a window for us to learn from European design. I also hope it can in some way help us improve the

level of industrial education in China.

The printing of the book in China mainland was appreciated by the readers. The English version was issued in Hong Kong and Taiwan and made a good effect. In Korea and Japan, the book was so popular that the copies were even sold out. All these brought about the "2009 Outstanding Overseas Copyright Award" granted to the book by Publishers Association of China.

On occasion of the second edition, the content of the book was enriched, according to some readers' feedback, with some design cases from famous companies and groups, which includes MV Augusta and CR&S, the top Italian motorcycle manufacturer. It might help the readers study design from a more diversified perspective.

Finally, I would like to extend my gratitude to Alfonso Carreras, my valued friend; Lin Genli from Guangzhou Sendpoints Books Co., Ltd.; Sun Jianhua, Design Supervisor with Hailing Home Decorating; Roberto Crepaldi, CEO with Italian CR&S; Donato Cannatello, Design Supervisor with CR&S; Prof. Enrico Leonardo Fagone from SPD; Boudewijn Soetens from Netherland VanBerlo. Without their extraordinary support, the book would have not been possible. Special thanks should be given to my schoolmate Chen Hua, who have translated the book wonderfully by her abound knowledge both in science technology and linguistics. I also appreciate very much the support from my students Lan Youdi, Chen Kai, Li Wenbiao, Su Bolin, Lin Jingjun. Thanks Virginia Sorlino and Cai Lijiang, who offered the excellent layout for the book. Thank again my co-authors Jordi Mila and Zhou Mingyu for the work they have done for the second edition of the book. Thanks also go to Liao Honghuan, the editor with Beijing Institute of Technology Press for her effort for the publishing of the book.

A big "Thank you" to my wife Jennifer Li and my daughter Alice for their love and encouragement.

Stone Wen Written in Wuyi University
2012-6-26

前言

愿此书开启你心灵创意之窗

好友Alfonso Carreras热心为吾引见欧洲著名设计师Jordi Milà已逾5年。Jordi是世界顶级设计事务所EDDA的创始人、总经理。迄今为止，Jordi已获奖无数，近些年，他获多项欧洲“红点”大奖。余久闻其盛名，诚邀其两次到五邑大学传业授道于五邑大学师生。经多番畅谈，与Jordi Milà建立了深厚的友谊。

交流期间，赏其佳作，余向其请教诸多设计的真谛，受益良多。我深为其才华所折服。设计师的创意灵魂在其草图上得到了完美的体现。研究设计大师的草图，是向大师学习的最直接最有效的方法。

为解莘莘学子及年轻设计师学习之欲，我请Jordi Milà合著了这本《欧洲设计大师之创意草图》。本书共分四部分：第一部分概述设计之哲学，读者可明晓创意之思维；第二部分剖析设计的表现技巧，读者可明察表现之要领；第三部分展示一个系列实际项目的创意过程，读者可探究其创意精髓于其中；最后是EDDA设计的一些成功项目及草图的简要展示，以开启读者创意之源泉。本书所引用的草图皆源自实际委托的开发项目，市场称誉的畅销产品。尤为可贵的是，本书的大部分草图是EDDA不曾公开过的，读者从中可以看到设计大师最初的创作火花。因此该书的实践指导性非常强。合作至此，我深感内地设计仍与西方优秀设计有一定的差距，望此书的发行能拓宽中国设计界之视野，同时为广大莘莘学子提供一个向西方设计大师学习的机会。

本书在我国内地出版时，深受读者喜爱，在香港和台湾地区出版了英文版本，并在韩国和日本市场反应良好。本书荣获2009年度中国出版工作者协会“输出版权优秀图书奖”。借此

良机，感谢海内外读者对本书的厚爱。

本书再版内容，结合一些读者反馈，余将本书部分章节进行了进一步的丰富，加入了一些著名企业的设计案例，其中包括意大利国宝级摩托车制造厂商CR&S及MVAgusta等。读者在研读更为丰富设计案例时，亦可学习到更为多元的表现技法。

此书面世之际，感谢良友Alfonso Carreras，广州善本书有限公司林庚利先生，海菱家饰设计总监孙建华先生，意大利CR&S公司CEO Roberto Crepaldi先生，CR&S公司设计总监Donato Cannatello，米兰工业设计学院（SPD）Enrico Leonardo Fagone教授及荷兰VanBerlo公司Boudewijn Soetens先生的帮助。感谢本书翻译陈华师姐，你兼有工科的学士学位及英文硕士学位，使本书的翻译尤为精彩。感谢学生蓝有娣、陈凯、李文彪、苏柏霖、林景俊不遗余力之助。感谢Virginia Sorlino及蔡利江版面之设计，你们的设计独具匠心，实乃上乘之作，令该书锦上添花。至此，感谢另两名著者Jordi Milà及周明宇先生为本书再版所做的大量工作。感谢北京理工大学出版社编辑廖宏欢为本书出版所付诸的心血。

感谢吾妻李翠叶、爱女子涵的关怀及鼓励。

温为才
于五邑大学
2012-6-26

about the author

Jordi Milà — product designer

Jordi Milà is a creator by vocation. Within his family his father, a builder, and an architect brother, have greatly influenced his drive to create and build.

His father did not understand why he wanted to become a product designer, a profession which was seriously undervalued and unknown at that time in Spain. It was often thought of as a lesser profession like a small scale architect, and his father would always ask him why. Jordi never knew how to answer, the drive came from within and there was no definite answer.

Jordi wanted to take on this professional challenge and demonstrate that design was as important as any other profession. His aim was to dignify and gain recognition for product design. Challenges have always been a great motivator for him, and the higher the goal the better.

He started his studies at the Elisava School (Barcelona) with a more conceptual vision of design. It was not enough, and in the spirit of growth he decided to widen his knowledge at the Art Center College of Design, (Montreux, Switzerland.), a highly respected institution where creative solvency was guaranteed and the training was highly professional. Even after completing these studies Jordi still felt the need for more, and he continued exploring new ground with his goal set on international projection. He took part in a work shop on product semantics at the UIAH (Helsinki, Finland) where the objective was to give the product a clear message – the product speaking for itself. It was a short, but very enriching experience.

Despite now working in a company, he already knew he wanted to found his own business and be his own boss. So he continued his growth by starting his own studio: EDDA DESIGN in 1995. He knew he didn't want to make chairs or lights, because everyone else was doing that. He discovered that there were many products he liked and no one was designing, perhaps due to a lack of courage,

or because they lacked the resources. Products like motorcycles or home appliances, which as well as a design, style and concept challenge, required technical support for their development. Jordi took on this new challenge and the business began to grow. At his point he realised that he needed a more professional outlook and he completed his academic training with a post graduate course at the University of Navarra IESE Business School in Barcelona.

Currently EDDA DESIGN's experience ranges from large and small businesses in sectors such as toys, passenger transport, motorcycle design, vending, leisure, medical equipment, furniture, illumination, etc. Companies like Mitsubishi Electric, HP, Roca, Suzuki Motor Co., Montesa Honda, Sony, Ideal Standard, Gigames, Illy, Grifols, etc. and he has been able to retain many of those clients and gain the standing he looked for in the profession of product designer.

Also, wanting to go above and beyond, commercialise his own products and take on ever riskier challenges, he has launched two brands of his own: Jordi Milà Unique, as a furniture editor with a very conceptual and artistic look that represents the most artistic side of Jordi Milà, and the creation of a production company White Monkeys with its opera prima "Sweesters." This last case goes beyond the product, providing it with a universe and bringing it to life through animation. Another challenge, that of continual development.



著者简介

乔迪·米拉——产品设计师

乔迪是一位专业设计师。他的父亲是建筑工程师，哥哥是位建筑师，他们对乔迪的设计创造生涯有着巨大的影响。

父亲不明白乔迪为什么想成为产品设计师。那时在西班牙，产品设计是一份被低估而且没有什么名气的职业，地位甚至不如小建筑师。父亲总问为什么，而Jordi并不知道怎样回答，在他内心只有一种冲动，一种无法用言语描述的冲动。

乔迪想接受这种职业的挑战并且想证明产品设计同其他行业同等重要。他的目标是让产品设计受到重视并获得认可。挑战就是他的强动力，目标越高越好。

在Elisava学校（巴塞罗那）的学习，使乔迪对设计有了更深的理论认识。为了再提高，他决定去具有很高威望的瑞士中央艺术学院拓展设计知识面，那是一所创新实力很强且训练极为专业的学院。完成学业后，Jordi仍然觉得需要学习，为自己的设计国际化，他加入了芬兰赫尔辛基的一个研究产品语义学的工作室—UIAH，那个工作室的目标是赋予产品明确的信息—让产品自己来说话。虽然时间不长，但他获益良多。

当他还只是在一家公司做设计师时，他就有了自己开创事业的念头，1995年他成功创办了自己的设计事务所—EDDA来继续自己的设计之梦。他不想只是设计椅子或灯具，因为其他设计师都在做这类设计。他发觉很多他喜欢的产品却没人设计，可能是因为设计师缺少勇气，或是缺乏资源。其实摩托车及家电之类产品都具有设计、风格和理念上的挑战，同时要求技术方面的支撑。Jordi欣然接受这类产品的挑战而且事业开始逐渐发展。那时他又意识到自己需要一种更专业的见解，于是在巴塞罗那Navarra IESE Business大学完成了研究生课程的学习。

EDDA的设计项目包括玩具、客运工具、摩托车、售货产品、休闲产品、医疗设备、家具、照明用具等。客户包括Mitsubishi Electric, HP, Roca, Suzuki Motor Co., Montesa Honda, Sony, Ideal Standard, Gigames, Illy, Grifols等。上述公司都是他常客，乔迪也因此证明了设计师的价值。

为了不断地超越，使自己的设计商业化并接受更大的挑

战，他创办了两个属于自己的品牌：其中一个Jordi Milà Unique，这个家具品牌的独特理念与艺术性也最能代表乔迪艺术化的一面；另一个品牌是White Monkeys制作公司，其代表剧为“Sweesters”。后者不仅是产品设计公司而且是动画制作公司，通过动画将产品带到了更宽的领域。Jordi正朝这一远大目标前进。



Stone Wen was born in 1979, in Ganzhou city, Jiangxi Province, China. In 2001, he obtained a Bachelor's Degree in industrial design from Nanchang University. In 2006, he finished his master courses in Beijing Institute of Technology, one of the most highly regarded universities in design education in China, and now he is pursuing his Doctoral Degree in industrial design there. He is also a teacher of industrial design in Wuyi University. He once worked for Ganit bicycle factory in Shanghai, Arcolectric Ltd. Co. in UK and Logitech Co. in Shengzhen. He provides design and consulting service for Coccase in Singapore, MHR(the world's biggest helmet maker), and MPT(a famous stainless steel product manufacturer). In 2009, he co-worked with Jordi Milà, a well-known Spanish designer, and published the book Practical Design from the Top European Design Studio-EDDA., which caused quite a stir in the industrial design circle in China. The English version of the book named Top Sketches published in H.K. sells well overseas. The book won the "2009 Outstanding Overseas Copyright Award" granted by Publishers Association of China. In 2012, the book Case Analysis on Excellent Eurasian Industrial Design was also considered a big success.

Zhou Mingyu was born in 1979, in Linyi city, Shangdong province in northeast China. In 2002, he graduated from industrial design department of Nanchang University. Three years later, he achieved his Master Degree in Design Arts from Beijing Institute of Technology (BIT). At present, he teaches in Design and Art School of BIT and presides over the programme of the graduates design studio. He has cooperated with many design companies and successfully carried out some exhibitions, including "Happiness Throughout Design," 2011 "HI-FUN-BIT."

合著者简介



温为才，1979年出生于江西赣州，2001年毕业于南昌大学，获工业设计专业学士学位，2006年毕业于北京理工大学，获设计艺术学硕士学位。现为北京理工大学设计与艺术学院工业设计方向在读博士。五邑大学工业设计系教师，曾任职于上海捷安特自行车厂、英国Arcolectric有限公司、深圳Logitech公司。现为新加坡Coocase设计顾问，同时为全球最大的头盔制造商MHR及著名不锈钢制品企业MPT提供设计及咨询服务。2009年与西班牙设计师乔迪·米拉合著了《欧洲设计大师之创意草图》一书，在国内引起了很大反响。该书英文版Top Sketches 在香港出版发行，畅销海外，并荣获2009年度中国出版工作者协会“输出版权优秀图书奖”。2012出版了著作《欧亚优秀工业设计案例透析》，市场反应热烈。



周明宇，1979年出生于山东临沂，2002年毕业于南昌大学工业设计系，2005年毕业于北京理工大学，获设计艺术学硕士学位。现为北京理工大学设计与艺术学院讲师。主持学院研究生设计工作室工作，并与众多设计公司开展合作。曾策划“幸福穿越设计”、2011“HI-FUN-BIT”交流展等多项设计作品展览。

about design

Much more than a beautiful render

Surprisingly at EDDA DESIGN we still meet business people and directors who think that a product designer is one who creates pretty images and “renderings” that are used to decorate things. Nothing further from the truth. For me, product design includes the whole process which starts by identifying a latent consumer need and ends by launching the product in the market. Under these parameters the designer has to be present in many aspects that go much further than a good illustration, occasionally taking a lead role, and on other occasions a back seat monitoring and tutoring role.

It is very important that aspects like existing intellectual property rights, regulations and standardization rules that the product has to meet ergonomics, mechanisms, mechanical components, materials, or production technologies, are taken into account when giving form to a new

product. On the contrary, the best thing that can happen is that you need to repeat the whole project with modifications. Just imagine the worst case scenario.

This wider role of the designer requires a constant interaction with specialists in diverse disciplines, with whom it is often necessary to communicate ideas that are only currently in our mind. In this scenario, the sketch is, for me, a fundamental tool in speeding up the creative process whether it is to immerse myself in the possibilities of the new design, or to communicate and transmit ideas to all those who take part in the creative process.

Just as words are fundamental for the writer in structuring a good discourse, the ability to set down on paper what we image in our mind through the technique of sketch is one of the principal tools of any good designer.

关于设计

不仅仅是美化

令人惊讶的是，在EDDA设计事务所里，我们仍然会接触到一些商业人士和企业高层，他们认为产品设计师就是创造精美图形和效果图来美化物品的职业。真的，他们就是这样理解的。就我而言，产品设计包含着一个大过程，其起点是确定潜在消费者的需求，终点是把产品投放到市场。设计师必须从多个方面切入到设计的各个环节当中，不仅仅是扮演美化的角色，有时设计师要扮演主导角色，有时在幕后起督导作用。

在赋予产品新的造型时，设计师必须遵循现有的知识产权、规章制度、标准化的行规，还需考虑人机工程学、

机构、机械零件、材料及生产技术。上述至关重要。反过来说，如果不慎重考虑这些因素，恐怕整个项目都得进行修改，从头再来。想想这极其糟糕的一幕吧。

设计师需要与不同学科领域的专家随时交流想法。我认为无论是深入考虑新产品存在的可能性，还是与项目的其他成员沟通想法，草图都是推进设计创新过程的基本手段。

文字组织能力是作家写好文章的基础，同样用草图将我们的想法表现在纸面上的能力也是成为一个好设计师的基础。

about sketching

Did you know that a sketch can be worth more than a million \$?

Not everyone gives the same value to a sketch. For some, it's no more than a scrawl on a piece of paper, for others it's one of many ways of communicating an idea using more than just words. For me, a sketch is hugely valuable. I believe it is the most rapid and efficient way of generating ideas: it allows me to put my own creativity up against the wall, allowing me to go a little bit further each time. It allows me to coordinate ideas with my colleagues and clients, in order to find faults, or to speculate over new possibilities. Even though it's difficult to believe, I have sometimes made over two hundred proposals for one product until reaching one that is satisfactory. If, instead of using a sketch, I had used 3D software renderings, the cost in time and money would have been implausible and the result would no doubt have been a lot poorer. For this reason, I think that a sketch becomes the most valuable element of a project.

If we establish that a simple sketch could be the starting point of a new product, you only have to take a look at everything that comes after in order to realize the responsibility it has. Given this, it's important that the paper that carries this sketch is very resistant, or everything you sketch on it could rapidly fall down.

To understand this better, let's do a small exercise of imagination and go through the whole process that starts after the client has approved a new concept by drawing a sketch in no more than 30 minutes.

In the case of designing for example a new motorcycle,

the process could continue with a model made in clay which could take an expert modeler 4 weeks. This model once finished, needs digitalizing in order to generate the exterior skins in CAD. From this point on, there could be six months of engineering development, with the prototypes necessary to test the industrial viability of the solutions we have adopted. Then, more functional prototypes need to be built in order to undertake all the dynamic tests and generate all the necessary documentation in order to build the manufacturing moulds. This process could easily cost more than 1 million dollars, or much more, if you add on the investment in product launch promotion necessary to give the vehicle a minimal visibility in the market.

From this point of view we see that what for some could be a simple drawing, for others could mark the difference between the success and failure of their product. My advice is to keep this in mind each time you sit in front of an empty sheet of paper.

I hope that this small sample of past projects helps you to understand my creative process, and encourages you to aim for excellence in your projects. Each time you are unsure of what you are going to present to your client, think that one more proposal will cost you at the most an extra hour of work. If you don't do it, once the project is launched in the market you'll spend a lot of time seeing it in the shops lamenting the way that things don't always end well.

关于草图

你知道吗?——一张草图的价值 可以超过百万

对同一张草图而言，并不是所有的人都给予同样的价值判断。对于某些人来说，它只不过是画在一张纸上的潦草笔迹而已；而对于另外一些人来说，它则是一种胜过言语的表达手段。就我而言，草图的意义重大。我相信它是一种构思方案最快、最高效的方式。我经常把自己的设计方案挂在墙上，然后通过草图把方案逐步地深入。通过草图这种设计语言，可以让我的想法与同事及客户们的意见相协调，并找出错误，再深入推测新的设计可能性。也许你很难相信，有时候为了得到一个满意的方案，我会画两百多张的草图。若是通过用3D软件制作，要花费的时间和金钱则难以想象，而且出来的结果无疑也会差很多。鉴于此，我认为草图是一个项目中最有价值的部分。

草图是产品设计的起点。绘制草图时，你必须预见后续出现的每个细节。记住，要保证绘图的纸张非常耐用，否则草图中的一些细节很快就会模糊不清。

为了更好地明白草图的重要性，让我们看看草图方案（其草绘时间不到三十分钟）获得客户认可后，产品后续的开发过程吧。

如设计一款新的摩托车，其油泥模型就要花费专业模型师四周时间。模型一旦完成，需要在CAD中产生外部轮廓。然后，为了完善方案的工业可行性，在工程改进方面还可能花费六个月的时间。接着，要制作更完善的结构模型来做所有的动力学测试和产生制造整套模具所必需的数据文件。这个过程轻而易举就超过一百万美金，如果再加上该产品投放市场的促销活动的投资费用的话，花费则更多。

从这个观点出发，我们会明白为什么草图对一些人来说是简单的笔画，而对另外一些人来说，草图则是他们产品成败的关键。每当摊开一张白纸，你都要记住这一点。

我希望曾做的这些项目可以帮助你理解创造过程，同时鼓励你们在设计中追求卓越。每当你对呈给客户的方案没有把握时，再画一个方案吧，那不过多花费你一个小时而已。如果你不这样做，一旦产品投放到市场，你可要懊悔不已，因为该产品不会有好的收益。

