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▲ 巴铁 1 号试验车

创新提速路在何方

——从中国的巴铁说开去

文 | 泰德·普林斯

上个月，美国各家报纸大量报道了一家中国公司发明“巴铁”的消息，对，就是那种车腹下面可以让两辆小型车并行通过的巨型“劈叉”公交车。

正如大家后来看到的，中国媒体上出现了很多评论，认为巴铁是一个疯狂的想法，根本不可行，更有很多报道说这是一个可能涉及非法集资的骗局项目。而对于旁观的美国人来说，个案的真伪并不重要，重要的是他们发现，中国人的整体创新能力已今非昔比，由此还激发了美国人的想象力。

关于巴铁，真正吸引美国人注意的是这种

标新立异的想法。标新立异的想法往往看上去非常疯狂，绝大多数人会将其视为痴心妄想，但大家又会很钦佩怀有这些想法的人，因为他们有勇气去试着将疯狂的想法付诸实现，哪怕过程中会一直迎着旁人的冷眼与嘲笑，也绝不放弃心中的理想。

美国有一大批这种狂人，埃隆·马斯克就是其中之一，他的疯狂想法包括发明纯电动汽车、可垂直降落以供回收再利用的火箭，等等。需要强调的是，马斯克已经如愿成为了开风气之先者，虽然当初很多评论家觉得他的想法太不切实际，但特斯拉电动车风行世界以及“猎鹰9号”火箭实现了一级火箭成功回收的事例都表明，他的疯狂想法是完全可行的。

你大概还听说过埃隆·马斯克创办了一家名为Hyperloop的超级高铁公司吧？他构想的是一种真空管道旅客运输方案，封闭的真空长管道里面的一节节胶囊式列车能将旅客以乘飞机的速度送往目的地。显然，这是一个彻头彻尾的“疯子”才能想出来的疯狂主意。

不过美国人超爱这个主意！Hyperloop公司现在已经获得了充足的启动资金，它最终能否成功呢？现在还没人能回答这个问题，正如我们不知道巴铁是否有一天能正式上路一样。重要的在于，想出这些创新点子的怪才们总是抱着不达目的不罢休的念头，这也是创新的意义所在。

创新者莫问出处

在很多西方人眼中，中国人的创新意识很差，更擅长“山寨”西方的技术。过去这可能是事实，但现在这种情况已经明显发生了改变。我在中国出差的时候，总看到人们在超市中用微信钱包结账，在这个领域，美国可能要落后五年。中国人还在用微信做很多别的事情，包括贷款、投资等，这方面美国也已经落后了好几年。

显然，我们不能说微信支付这个创新源于西方。总地来说，西方人对这个技术并没有太多概念，至少美国人是如此，虽然欧洲的网络支付技术出现比较早，但也不是这一技术的原创者。正如近期《经济学人》杂志上的一篇文章所说的那样，如今中国和西方实现了创新的双向交流，而不再像过去那样只是单方面的传递。更应当引起西方人注意的是，现在中国人想出的新点子比他们以前借鉴自西方的技术要更有创新性。

▲ Hyperloop 超高速列车概念图

泰德·普林斯
佩斯领导力研究院创始人暨CEO

可能中国人自己对此都有些吃惊，因为人们普遍认为中国大学的整体教学质量和科研水平要落后于西方发达国家，所以发明创造的水平也会落后于西方，尤其是美国。但事实并非如此，优秀的发明家并不一定出自名牌大学，很多创新者的学历并不高。有一个实例可以证明这一点：虽然非洲的经济不发达，但也有很多高水平的发明。

更让大多数人意想不到的是，低水平的大学中可能更容易诞生好的发明，因为在这些大学里学习或工作的创新者们知道，学校对自己的发展不会有太大帮助，只能自己寻找出路。此时，他们当然也很需要来自大学之外的资金和技术支持。

中国的很多企业都拥有高水平的设备和技术能力，所以那些资质平平的大学中的创新者们很容易就能找到支持者。从这个角度说，中国大学教育整体水平相对不高这种情况激发而不是阻碍了中国的创新事业发展。

在美国，很多优秀的创新者，像彼得·泰尔和马克·扎克伯格，都有在读大学期间退学的经历，我发现，现在中国也开始出现这种现象了。这大多是由于他们对大学教育过多地重视学术性和理论性感到不满，觉得难以从中切实获益。对他们来说，及时离开大学去做一些在教授们

看来不可能的事情更为有趣，也更有意义。

著名亿万富翁彼得·泰尔是全球最大的支付平台Paypal的创始人之一，他创立了“泰尔奖金计划”，为20岁以下的年轻创业者提供资助。这项奖金的资助条件之一是受助者不能去读大学，申请拿奖金的在校大学生也必须退学。这是因为在他看来，大学教授的思想普遍比较保守，不喜欢那些有标新立异想法的怪才，因此大学教育阻碍甚至完全破坏了创新力的发展。

还有一个事实我们必须承认，那就是各种族的人类拥有同等的智商水平，各个种族中的智商水平分布也是相同的。同样，创新者在每个族群中所占的比例都不大。

西方社会有超过30亿人，以国家为单位来看，美国的人口在其中占有很大的比例。中国有将近14亿人，几乎是美国人口的5倍。照此推算，在其它条件均等的情况下，中国的创新者数量应当是美国的5倍。目前我们看到的实际情况与这个理论推算有很大差距，原因可能在于很多中国人生活在农村地区，他们受教育很少或完全没有受过教育，经济条件也比较差。不管怎样，中国理应出现人数多于美国的创新者人群，至少应当是美国的三倍、四倍。一旦这种情况成为现实，我们就会看到更多类似于巴铁这样的疯狂创新从中国涌现。当然，其中的大部分创新会遭遇失败，但剩余的那部分中，将有一些能够深刻地改变这个世界。

在大量的创新中，一部分可能源于西方，就像滴滴出行那样。但我们将逐渐看到一个新的趋势，即源于中国的创新被引入西方社会。这肯定是会发生的，例如，目前中国的网络金融技术世界领先，西方人除了向中国学习之外别无选择。

即便是那些源于西方的创新技术，中国的公司引进之后也又做了很多创新性发展。比如，滴滴出行吸取了Uber的创新点之后，又融入了一些独有的新方法，像“拼公交”这样的服务是Uber完全没想到的。这时，就又轮到西方人向中国公司学习了。经过一轮轮的创新，将呈现出“你中有我，我中有你”的共赢局面。

1949 年的日本青少年科普杂志封面上刊登的名为“恐龙卡车”的交通工具设计漫画图。

如何培植创新土壤

创新中最关键的要素是人，而创新者基本上都是怪才。我的公司在识别创新者方面做了很多工作，由此找到了如下一些创新者的共同点：

- 通常非常内向，社交能力较差；
- 不在意别人对他们的评价，不受他人金钱左右；
- 行事极为果断，做事非常执着；
- 易怒，不喜欢他人指点自己应该怎么做；
- 叛逆心较强，不喜欢被老板和组织约束；
- 特立独行，乐于打破传统观念和方法行事并以此为傲。

显然，创新能力强的人不大好相处，而且人们一般也见不到他们。因为他们不会主动推销自己，只希望别人关注他们的奇思妙想。

如何主动出击去发掘创新者呢？做评估测试是一个方法，但这也存在问题，因为大多数人都觉得自己具备创新能力，所以可能有意无意地在测试中作弊。

如果你委托一个机构来鉴定创新者，他们通常会找出一些口才非常好的人，因为他们往往分不清口才好与创新能力强的区别。他们还可能选出那些擅长创意的人，但创意并不等同于创新。机构鉴定者还可能选自己的亲支近派或是自己喜欢的人，总之就是找不到真正的创新性人才。所以与之相比，倒是测试显得更靠谱一些。

还有一个问题，就算你找到了真正的创新者，也很难管理他们。因为他们发明的东西往往难以得到所在机构的认可，双方最终只能分道扬镳。即便他们能勉强留下，也无法得到重用，甚至可能遭到处罚。公司里那些位高权重的人会要么公开要么秘密地不支持甚至惩罚他们。所以，希望充分发挥创新者才能的公司必须使用一些技巧和一套专门的规章来对待他们。首要的一点在于，公司应当公开表明欢迎并鼓励

大家拥有不同的想法，而且这种支持必须是真心实意的，否则很快就会被大家识破。

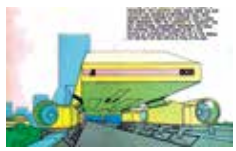
鼓励创新型怪才的另一个好办法是，当他们说出想法之后，让他们去亲自实践自己的想法。还应当注意的是，在创新者进行尝试的首创性过程中，领导不要指手画脚。否则他们会觉得自己不过是上级操纵的木偶，实践创新性想法的热情会因此消散一空，要么不再集中精力做事，要么干脆另起炉灶。

虽然留住怪才很难，但有志于创新的公司还是应当努力尝试去做，因为他们的想法很可能会改变世界。这种怪才在中国为数不少，真正的问题在于公司的企业文化是否允许他们自由发挥。很多企业都处理不好这个问题，这很常见，大多数欧洲企业同样存在这一问题。在这方面，美国文化有很大的优势。

美国人通常喜欢并尊重创新型怪才，再荒诞不经的想法也会被他们视若珍宝。他们会非常钦佩那些有勇气去实践那些在别人看来完全行不通的想法的企业家。因为这类企业家在美国很多，所以美国企业家破产的几率总是比外国企业家要高。但人们也总是希望那些创新型怪才失败后重新再来，而不是彻底放弃，然后去大公司随便找份工作。

欧洲的文化就不同了。在大多数欧洲国家的人看来，失败是一件很糟糕的事；破产更是一种严重过错，很多欧洲国家是不允许破产企业家开办新公司的。所以欧美文化在这方面的区别在于，欧洲人不宽容失败者，而美国人认为失败是成功之母，创新型怪才在美国即便失败也会有很多东山再起的机会。

中国文化也面临着这个问题：如何看待创新型怪才，是否给他们失败后再来的机会？从整体上说，我认为中国在这方面更像美国而不是欧洲，但也还有很多需要完善之处。从个体角度说，中国人可能会比美国人更具创新能力，但要真正发挥出这种优势，还需要企业文化、政策法律等方面的配合，只有为创新型怪才提供合适的土壤，他们才能充分施展自己的才华。



1969 年，美国波士顿的设计师克雷格·霍吉特（Craig Hodgetts）、莱斯特·沃克（Lester Walker）提出了名为 Bos-Wash Landliner 的交通工具概念设计方案，它往来于波士顿与华盛顿之间，时速约为 96 公里。

抛砖引玉说交通

最后，让我们回到本文开始的话题。交通拥堵与由此而来的空气污染是大城市普遍存在的问题，中国的大城市、特大城市为数不少，自然也深受其害。在解决交通问题方面，中国人想了不少办法。从理论上说，巨型“劈叉”公交车算一个解决方案，除此之外，是否还有其他办法呢？

接下来，让我就此问题提一些看上去非常怪异的点子吧：

公路列车　让几十、几百辆汽车通过软件互相联系，以便在路上行使的时候采取一致行动。

太空电梯　现在科学家研究太空电梯是为了向空间站运输物资，我们还可以研发一种太空电梯，将旅客送上高空轨道，然后快速运往地球上任何一个目的地。

中国版的超高速列车　中国科学家在高速列车领域很有心得，在研发真空管道高速运输技术方面是有优势的。

多层公路　可以将公路层叠起来，而不仅仅是在平地上铺一层，这有些像高架路的复合版。中国有很多出色的城建工程师，能在这方面大显身手。

智能道路　通过电子手段让道路与行驶其上的汽车直接交换信息，让道路本身成为疏导交通的交警，这不但能减少堵塞，还能减少空气污染。

自动驾驶自行车　给自行车、滑板车装上自动驾驶软件，让更多的这类车辆能够合理地分配使用相对狭窄的自行车道。骑行者得以在可控和安全条件下骑得更快，还能减少与汽车驾驶员之间的相互干扰。

在你看来，以上这些想法算是非常怪异呢，还是不够怪？如果是前者，大概你还不够善于接纳创新型怪才；如果是后者，说明你自己也算得上此类怪才了。正所谓“不破不立”，来尽情享受创新的快乐吧！

“The Future of the Car and the End of the Wheel”

Dr. E. Ted Prince
Founder and CEO
Perth Leadership Institute
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Investment Circle (Beijing)
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The future of the car now seems to have been finally agreed and settled. It’s going to be something that drives itself. All the car companies, technology visionaries, social theorists, government regulators and just plain old citizens have now been persuaded that the future of the car is no car driver.

It’s a beguiling vision and what’s more, it will probably happen. But we shouldn’t be fooled into thinking that’s all there is to the story. That the future of the car is just that they will become self-driving.

I think that vision is already kind of boring and doesn’t really do justice to the other massive technical and social changes that will also impact the car. So now I’m going to talk about one of them.

Wheels are dead. That’s what I think. The future of the car is going to revolve around mobile people transporters that don’t have wheels. That’s the future of wheels. There isn’t one.

Wheels are such a bore

First let’s look at wheels. They have been with us for a long time, at least 5000 years. The Romans used them. So did many other civilizations. So one thing we can say is that they are one of the oldest inventions still with humans. They are right up there with fire and agriculture. So it would seem that its way past time that they were disrupted and improved upon.

How is that when every other thing we humans use has been made obsolete and reinvented, that we still have the wheel? Isn’t the wheel terribly old and primitive? After all, being transported on something physical seems so old-fashioned.

Let’s remember that the wheel, although terribly old, hasn’t basically changed in 5000 years. Maybe the biggest change was the tire, but the whole thing still has the same basic shape and structure.

What’s wrong with wheels anyway?

First of all they weigh a lot. They are made of metal and rubber and so each wheel with a tire weighs at least 50 pounds is or about 20 Kgs. That means that 4 wheels weigh about as much as a heavy person.

So that means that a car has to be built heavier and stronger to support the wheels. And with an additional weight of an additional person, that means a lot of extra fuel to make the car move. And that additional weight also affects the handling of the car. Finally the additional weight affects how long the car lasts.

We don't normally think of all these things because we never think about a car that didn't have wheels and how it would perform. Clearly if you don't have wheels that revolutionizes the performance, durability and effectiveness of the transportation it provides.

Here's another problem with wheels. They create resistance to the movement of the car. Sure it's better than a wheel without tires. And of course it's much better than say a wooden wheel with no tires that travels over a dirt track rather than a paved road.

But it's still resistance. And resistance slows you down. It increases the amount of effort – say a horse – or fuel – usually gas – that you need for it to run. That means it costs a lot more to run than a solution that didn't use wheels.

And that additional cost also results in heavy pollution. Heavy wheels that create much resistance result in you using a lot more fuel that some other better alternative. So wheels also increase the amount of pollution in the air. That's a health hazard.

It also adds to the amount of carbon added to the atmosphere by humans. Ultimately that impacts the planet increasing carbon emissions and global warming. There are a lot of wheels out there so the overall impact of wheels on global warming and pollution is massive.

Again we never think of that because it's pretty unusual for anyone to propose that we should get rid of wheels. But that's what civilization is all about – improving the lot of humans and the planet. And wheels are a big factor that get in the way of achieving those critical goals.

There are other issues too. You need to stop wheels from turning when you want to stop. That means you need brakes. That again adds weight to the car.

Brakes emit dust into the air and that adds to the health hazards and greater pollution of the air. Brakes waste energy. You have to keep replacing them as they wear out. That costs a lot of money. Sometimes people don't maintain their brakes properly and then they get into accidents. Often that kills somebody or injures them. So there are even more health hazards.

Of course, you might say that cars have to be able to stop so there's no alternative. We will come to that argument in a moment.

In the meantime let's think about the advantages of having cars that didn't need wheels or brakes! Wouldn't that be an enormous benefit? Wouldn't that revolutionize cars? And, in that process, wouldn't that revolutionize pollution control, carbon emissions and the sustainability of the planet!

It's pretty clear that wheels are ripe for replacement, a disruption waiting to happen. They are way beyond their past-due date. The question is what is their replacement?

What could replace wheels?

OK so this is the Big Question! It's fine to say that wheels are old-fashioned and have lots of disadvantages but what's the alternative? Surely if there was an alternative we would already be using it! Isn't it kind of stupid to think that something else could replace the wheel?

Ever hear of magnetic levitation? China has had a maglev train for years that goes from Shanghai airport to downtown. Japan has many maglev trains. They work on the principle of magnetic repulsion to hold the train off the wheels. And something called a linear motor propels the train forward. To stop all you do is reduce or cut off the power. Easy.

Actually the answer to the no-wheels issue is staring us in the face. That face is the maglev trains in China and Japan and now that disruptor-in-chief, Elon Musk has already invented another variation. It's called the Hyperloop. It's a maglev train with a linear motor but there's one other tweak. That tweak is that it runs in an evacuated tube so there's no air resistance. Simple but neat.

You can view the wheel-less car as a loopless Hyperloop that runs in the open air. It's got the magnetic levitation and linear motor in the one shell but there's no evacuated tube. Neat too.

In effect the maglev trains already in existence and the Hyperloop are wheel-less people transports but just running on rails. The real limiting factor is the rails. They stop you going anywhere except where the rails go. Not neat.

No wheels, no rails

So what, I hear you say. How can a car with no wheels get anywhere if it needs anti-magnetic rails underneath it so it can move? My answer: why can't we build roads with the necessary electrics already embedded when you build them initially? With a bit of smart electronics you could make sure the vehicles riding above can only ride in certain locations, either through having physical or electric guides. I think Chinese entrepreneurs and engineers could work that one up pretty quickly.

We could then call it maglev for the masses or MagM. Instead of a modern high-speed bullet train that might be a little expensive for some people we could have MagM for the Common People. Put them on the top deck, so to speak. Spread the wealth around a little.

Did you see that in the US some entrepreneurs have just come out with an announcement that they want to build a maglev railway between Washington DC and Baltimore? Of course, like all railroads – in China and the US - it will lose money.

Why not make it a maglev road instead? The masses could then use it, and their wheel-less pods will run free on power from the road, instead of being onboard. Zero emissions, ultra-low carbon. Let's stop climate change in its (maglev) tracks (so to speak)!

Maglev roads will be a new social innovation. They will release trains from only going where the expensive rails can take them. Instead the roads can take cars without wheels anywhere. Isn't that a new kind of freedom for people?

The wheel-less life

OK so a wheel-less car, ho-hum. Seen it all before (kind of). How does it make a difference to my life?

There's a lot of gloom out there. Rising inequality, declining global growth, slowing populations, wars everywhere, ISIS, disaffected youth, terrorism, etc. etc. The only way to combat all of this dysfunction is a huge spurt in global growth that lifts all boats, not just a few. So we need something to get that all going. It's gotta be big, it's gotta be different and its gotta be really disruptive.

Eureka MagM!

I've suggested elsewhere that space exploration will be the new driver of global economic growth. I've also suggested that maybe even stellar exploration will make this happen. But maybe the wheel-less car revolution is going to be the initial driver that's going to get this growth spurt going.

How so? Well if we really want the self-driving revolution to succeed we have to make it cheap as well as safe. The way to do this would be to have roads that make it almost cost-free to be transported anywhere. That means not just self-driving cars, but a cost of transportation an order of magnitude less than we have today with gas or even electric cars. We can do that by removing wheels and tires. But you have to have special roads.

So, you might say, who's going to pay for that? Well, that's what we did in the early age of the car. Remember the only ways cars could be successful is if you had asphalt roads for them to run on, otherwise they couldn't go fast enough to make them really worthwhile.

We often forget that what made the auto worthwhile and effective was not just the technology of the internal combustion engine, but the infrastructure to allow them to drive fast and freely, namely paved roads.

Road infrastructure is now so 19th century. Current roads are an obsolete technology with their disruption waiting to happen, just like wheels on cars. The next big revolution has to be no wheels but that will also need a wholesale change of roads and road technology.

That means roads that are built embedded with maglev (or something similar) so that any auto can travel on it a cost dramatically less than that today, dramatically faster, and dramatically safer. That means no wheels.

The opening up of the US and most other countries including China was driven by rail – maglev without the mag. The second opening up was with roads, rails without the limitations of rail. The third wave is going to be wheel-less roads, MagM.

Just like the first two transportation revolutions, this will prompt another opening up. It will be wholesale transportation on a gargantuan scale. That will require massive investment, massive employment of people both with advanced skills and without them.

So that's my favorite candidate for the next global growth revolution. You can view the Hyperloop as a visionary but still hesitant step in this revolution. With its maglev achievements, China is perfectly placed to take the first great leap.

The end of all wheels

If it's the car, what about other machines? Can we get the same types of quantum leaps by replacing wheels in other machines? The wheel-less economy and society. Wheel-less technology. Wherever there's a wheel there's a disruption waiting to happen!

If we don't need wheels for transportation, and if by eliminating them we can drastically reduce costs and get unimagined benefits, can we do it in other areas too? After all, all kinds of industry use wheels in some shape or form. Cog wheels, spinning wheels, gear wheels, rollers and so on.

If we eliminated wheels in industry could we radically transform industry too generally? If we could radically reduce or eliminate resistance in all machines, eliminate the weight of the wheels and the overall weight of the machine, how much could that improve the profitability of all companies in all industries?

And if we did this could we transform human society in other, even broader, ways? By reducing carbon emissions and global warming, reducing pollution, increasing energy efficiency we are going to increase productivity and the value of human creativity and work. If we did this could we end up transforming human society in much the same, revolutionary way that it was transformed when humans first started using wheels, first for transport, and then for industrial machines?

By finding new ways to achieve the gains that we origanlly achieved by using wheels, can we also achieve a new quantum jump in productivity and output for humans? Could this be the driver we need to take humans into the next revolution in work and productivity? Could it be that we need wheel-less machines to explore the planets and to build even more revolutionary new types of machines?

Wheel-less cars will not just affect transportation. They will affect humans and the future of human society. It's time for Chinese entrepreneurs to start to look at this area to see where they can personally bring about this future.

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