Hello, everyone! Welcome to another episode of Q&A about business, innovation, and managing life.
Let's see… See a question here from Kathy.
Does, using AI help you learn, or does it short-circuit the learning process?
It's an interesting question, and I don't think we fully know the answer yet.
I mean, if you have been given an exercise where the AI can just do that exercise.
maybe it's the wrong exercise. I mean, this is an issue that came up years ago with calculators, came up again with Mathematica, came up again with Wolfram Alpha. It's the… if the meat of what you're being asked to do is something that has been automated.
Maybe that isn't the key thing that you should be being asked to do.
And the whole point is, once that thing has been automated, there's now more things that you might be able to do. The expectations should be raised. You know, we're about to have this issue because we have our summer programs coming up, where we have our summer research institute and our summer research program for high school students, and this is sort of the first year where lots of AI-based
Wolf and language programming is really doable. And many of the projects that have been done in previous years, a version of them could probably be done by just feeding the prompt to an AI and saying, do something.
So that, as far as I'm concerned, that translates into what I expect should be possible now is something bigger and stronger than what was possible in the past, because there's a new tool that's available. Now, I mean, in terms of
learning things.
And how AI contributes to that. I have to say, for myself, I'm still not necessarily fully developed in my thinking about this, but when I want to learn new subjects, or want to learn about something, it's… asking an AI to summarize it for me works quite well, and particularly when I tell the AI, this is… I know about this and this and this.
summarize this for me. It's quite helpful, and it's more helpful than just reading a generic, this is a summary of that story.
which doesn't have that sort of prior information of, oh, I know about whatever. I was recently asking it something, maybe yesterday, about some
particular, development in, kind of, mathematical quantum field theory, and I'm like, I know about traditional quantum field theory, and this and this and this. Tell me about this new thing, and it did a pretty good job of explaining the new thing with reference to the things that I already knew about. That's very helpful.
I think that, this question, again, so for example.
what I've been trying to work out is for our summer programs, for instance, what should our expectations be? So I think one of the key things is that, for example, Wolfram language is a notation for expressing thoughts computationally, and as such.
It's part of the sort of communication channel between humans and computers.
It's not something where, in sort of traditional programming languages, you're just writing a blob of code that's for the computer and not for the human.
with Wolfram language, you're writing something which is where you're using the language as a notation to communicate thought, and a way to sort of crispen up your thought.
And so, I think one of the key things is, if you write something that's a computational essay, for example, you're expected to understand everything that is the input that you wrote there, which means the English text, the computational language text.

Those are things that you're expected to understand, and you should make… go to the effort to write them, just as you would go to the effort to write the English text in a way so that it's understandable, so also go to the effort to write the computational language in a way that's understandable, which means it's not just an AI spewing out blobs of code, nor is it an AI spewing up blobs of text.
If you produce something where your computational essay is just a bunch of AI stuff.
that's probably not going to be terribly useful. Maybe the AI could say a few things in ways that are clearer than you could say them. So long as you have kind of fully processed them yourself, I suppose it's okay to present that.
But, you know, it's… there's no point in rewriting the sentence just for the sake of it not being AI-written, but if you don't even understand the sentence, then that's absolutely useless.
I mean, I've seen that a bunch with people recently, including some people I've worked with, where they're, like, producing, you know, AI
Stuff.
that I don't think they understand, and this is not very helpful.
I mean, it's… it's very easy to get computers to produce things that one doesn't understand, and where you might say, well, somebody out there might understand this. I mean, I will say that a lot of science that I've done consists of just going out into the computational universe and running programs, and every program one runs does something. The question is, is there something that it does, something that kind of
It connects to what we humans are interested in or understand.
So, it's to just say, hey, I can produce all these things, I can produce all these pictures, I can produce all these whatever, that's something that we've been able to do, and I've done lots of over the years. I consider my mission in using those things for science is to do what science does, to connect what is sort of naturally out there in the world, in this case in the computational world, with things that we humans understand.
And that's the thing that people need to do when they're kind of using AI. That's also sort of going out into the computational universe and sort of just plucking things out of that. It's not quite as direct as the kinds of things that I've done in exploring the computational universe, but it's the same kind of idea. And then the question is, are you getting that to be something that sort of is connected to human understanding?
I mean, there are the, so…
in terms of learning, as I say, one of the things is how do you, sort of.
take the things that people are expected to do and adapt them for the fact that there are new tools available. I think the…
one of the key questions is, what is the conceptual framework that the person is developing? Just saying, hey, I can file all this paperwork.
that is the answer to the prompt that I was given doesn't really do anything for anybody. The question is, what are you building up? What are you able to understand and reason about and come up with the next question to ask, or whatever else? And a lot of that is kind of forming ways of thinking about things. AI can absolutely be helpful in summarizing what's already known, presenting it in a way that you might be able to understand.
showing you, sort of, examples of code that can be written, things like this. But in the end, I think the objective has to be that you're able to do the… you're able to figure out what you actually want to do next. The AI is just going to say, hey, I took what you asked me to do, and I did what I could do with that. It's not in the, this is what you should want to do next.

I mean, if it's doing the, this is what you should want to do next, it's…
just kind of recapitulating what it was trained on. It's not… it's not something where if… if you have kind of the sort of free thought of doing something, that's the thing that sort of has to come from the human, because there's an infinite number of those kind of free thoughts that you could have about what you might want to do next, and the choice of which one it is, is something that is sort of quintessentially coming from
from the human, so to speak. So I think the ability to be able to make those sort of free thoughts about things is what one should be learning.
And it certainly is the case that to learn the facts of an area, and you do need to learn facts, because that's the way that you get to sort of figure out what's out there and what you want from what's out there, and so on, but… but the, you know, learning those facts, AIs can certainly help you to get, sort of, versions of those facts in forms that are more palatable to you, and so on.
and be able to drill down to find the facts at all from sort of searching the web and digesting what's on the web and digesting what's in training data and things like this. But I think the thing is, from that stuff, how do you fit the things that the AI is telling you into a conceptual framework that you really have your arms wrapped around?
It's no good to have the AI just tell you a bunch of stuff and, oh, I don't really understand that, but I can tell it to somebody else. That's not helpful. It's not going to help you, so to speak, to… to sort of develop
what… how you could develop, so to speak. And I think… I think the, sort of, the challenge of… of, sort of, turning
I mean, as far as I'm concerned, the most important thing, sort of, humans can
Learn to do is to think well.
And to think, sort of, at a foundational level about things. And that's not just a matter of, sort of, the abstract principles of thinking, it's also a matter of knowing lots of facts about the world, because to think meaningfully about things, you kind of have to have that thinking anchored to actual things in the world, whether it's the history of things that have happened in the world, whether it's the way that physical things work in the world.
whether it's lots of other different aspects of the world, whether it's the way that biology happens to evolve on this planet, whatever else. These are things that, in order to think meaningfully, you have to be sort of anchored to those, in a sense, arbitrary facts. I mean, the fact that evolution worked the way it did on this planet is a matter of a lot of coincidences, so to speak, a lot of chance events. It doesn't necessary that it
be that way. And similarly, the arc of human history is the result of lots of chance events. It doesn't have to be that way, but knowing how it actually has been is important to be thinking meaningfully about what one does today, so to speak. So, I think the,
This, you know, learn to think
learn to think foundationally, in the sense that you are able to say, what is the essence of this thing that I'm thinking about, and maybe what's the… the sort of… there might be a, oh, there's a standard track you think along these lines, but you have to be in a position to say, well, what if that standard track wasn't right?
can I actually… am I actually at the point where I can, the, where I can kind of, take,
you know, get… where I could redirect it if that really wasn't the right thing, or am I, you know, do I not have the kind of force of thinking necessary to do that redirection? And I think that's sort of the criterion, and that's what one should be… one should be learning, so to speak.
the, it's, so… That, that,

So, I think the, in terms of
of, sort of, where education should be going. As far as I'm concerned, that's where it should be going. And in some ways, that's going back to what education was like
before the sort of modern post-industrial Revolution age. I mean, education was often about, you know, learning about philosophy, rote learning, in some cases, facts about things, but at least learning facts about things.
And then, you know, some part of what education turned into was something that is much more, you know, can you do these, these sort of mechanical kinds of things, and so on? And, the,
And what, and that seems like it's the thing that now a lot of those mechanical things can be automated, and so we're back to the very human things that education can achieve. Anyway, a few thoughts about that.
Let's see…
Sammy asks, what are the first three questions you ask when someone pitches you a business idea?
They're not the same every time.
you know, when somebody tells me some business idea, sometimes some aspects of it are very clear, some aspects of it are completely muddy. The, you know, what I'm always interested in is what is the essence of what's being talked about? Is it the
And what kind of a company, what kind of a thing is being… is… is being sort of promoted?
Maybe the issue is, okay, it's, you know, you're trying to build some piece of hardware where it's completely unclear that this is possible to build at this time in history.
or it's completely unclear this is consistent with the laws of physics. That would be one thing that you would probe.
Or another thing might be, somebody has this idea, and it might be a fine thing on its own, but you have no clue how they would present it to the world and get it sort of exposed. It has a market that might be incredibly broad, but very fragmented and very hard to reach.
So, you know, what I tend to always think about is, you know, what is the essence of the idea? What… also, sometimes.
the people who are presenting the idea, it'll be very clear what their capabilities are, and, you know, there's… there's… it's kind of silly to ask somebody where, you know, you can plainly tell that they're highly capable in some particular area, you know, and other ones where, you know, you might say to somebody, you know, who's got some plan that involves
organizing this whole complicated thing, it's like, you know, have you ever managed anybody? Have you ever sold anything? And, you know, that might be an issue, but that's a silly question to ask if you're dealing with a third-time entrepreneur who's, who's clearly been successful at those kinds of things in the past. So I think it's very,
the very, kind of, specific to, you know, to, to what,
What… what you're being presented, so to speak.
I mean, you know, sometimes it's like, how on earth is this kind of thing going to make money? Sometimes it's, you know, how could you possibly make this work?
sometimes it's like, I don't even understand what the product is, I don't understand what you're selling, I don't understand, you know, these kinds of things, but other times, that's not a thing you need to ask.
Okay, Sunna is asking, will he be watching or attending any of the World Cup games? The answer to that is a plain no. I'm,
I don't know, I pay attention to lots of kinds of things. Sports are not something I have ever

been really into, and it's… it's not… I'm not claiming that as any superiority on my part, it's just… it's just something I've not really paid attention to. I'm not, sort of don't know enough about it to… to care, so to speak.
And, it's, and I'm… I'm not a great passive watcher of things. You know, I feel like I… if I'm going to be watching something, I have to be at least sort of internalizing and thinking it through for myself, and kind of… and I don't really… since I know nothing about, you know, playing soccer, I probably played it, you know, four times or something when I was a kid. Probably I should have been doing it much more, but I…
used to sort of get out of these things, because I didn't… didn't, weren't into them at that time. So the answer to that is definitely no.
Sammy is also asking here, when you have a big decision to make, where do you start?
I mean…
it's always, I think, for me, the same kind of thing. Break it down. What is the essence of what's being talked about here? And then, sort of, how do I sort of play the game out a few steps forwards and see what the consequences of the different possibilities, if it's a, do I do this or do I not do this?
It's kind of like, well, okay, what are the consequences of doing that? What are the consequences of not doing that? You know, can I kind of game out what's going to happen? But also.
you know, I have to say, it's very, very often the case that if it's, you know, oh, is it, do I do A, do I not do A? Do I do A, do I do B? And it's always… it's often presented as, there are just two possibilities.
But usually there aren't just two possibilities. Usually there are other sort of compromise possibilities, or very different possibilities, and sometimes those are the best thing. And often, when you get to the point where it's like, do I do A or do I do B? And they both seem like reasonable possibilities, but they seem mutually exclusive.
that's a time when you should think about, you know, is there an option C that gets you the essence of what both A and B would have got you, but it's in a slightly different direction? I mean, I think that's,
And I suppose in, in,
sometimes when I like to, you know, there's some decision to be made. You know, I make lots of decisions, I make decisions quite quickly, and I'm, you know, quite, you know, I've made enough decisions in my life
That, sort of, it's like, make the decision, move on. Don't spend all your time thinking about, kind of, oh, did I make the right decision? Sometimes, sometimes even many years later, it will be like, let's sort of do the post-mortem, you know, did… was that in fact the right decision? Usually, you never know.
usually, you know, I could say, you know, if I'd made different decisions in my life.
I'd still be a physics professor at Caltech, you know, or something like this, you know, 40-something years, 45 years later, or whatever. Well, you know, would that have been a good thing to do? I don't know. Sometimes it's,
In many ways, no, it wouldn't have been a good thing to do. In some ways, it would have been fine, but it would have depended on the ways that the world has evolved, and which you can't know up front, and where you might bet on something, and then you bet on the wrong thing, and so on. So I think

And it's worth learning from, you know, past decisions and things you might consider mistakes. It's not worth, sort of, agonizing at the time if you can stop yourself psychologically from doing that.
I suppose the thing that I tend to do with, sort of decisions and so on is sometimes it's kind of like, what's the worst case analysis? I make this decision, I don't make that decision. It's like, what's the worst that can happen, and how do I remediate whatever the bad thing was that could happen if I make this decision rather than that decision?
And
That's… that's sort of a… I suppose, for me, almost psychologically, that's a good thing, you know? What… what are the bad things that could happen? Okay, what do I do if those bad things happen?
I suppose another thing about big decisions is that sometimes I'll kind of have started thinking about that decision, and I'll kind of see, you know, okay, I think I'm going to do this. And it's like, how do I feel about that?
after, you know, a few days, a week, longer, you know, does that really ring true, or was that just something that I, you know, don't really believe in? I'll give you a very trivial example of that, is with things like book covers. Very trivial kind of level of decision.
But it's kind of like, well, sometimes it'll be like, okay, we're looking at this, and yeah, that one looks pretty good. But I tend to want to just…
get sort of a mock-up of the thing, I just have it lying around for a few days. And I find that I… my decision about it clarifies. It's like, yeah, that's pretty good, I like that. Or, you know, I don't really… you know, after… after rattling it around a bit, I don't really like it. And it's the same with sort of more conceptual decisions. After you're like, I think I'm going to do this, and you're like, okay, I'm gonna do that, and so on.
And maybe… you know, maybe you talk to other people about it. I have to say.
for me, it's… it's become… an awful lot of people talk to me about decisions that they make. I wish I could talk to more people about decisions that I make. It's… it's gotten to the point where I'm experienced enough in making decisions that… and people who I might talk to about making decisions know that, and I tend to have the sort of pathological situation where people say, well, what do you think?
Now, I admit that sometimes the, well, what do you think kind of justify why you're making that decision is a useful question for somebody to ask. Even if they have nothing to actually contribute to what you should be doing, merely asking you to explain why you think that's a good idea is actually a good thing. So I suppose, actually, that would be one sort of trick, in a sense, about decisions, is, you know.
have somebody else, you know, ask them about that. If you ask them, their advice may or may not be sensible, because it is, you know, it is non-trivial to give advice that actually is… sort of relates to the person who wants the advice, rather than the person who's giving the advice. I mean, that's just…
it's kind of like, well, I did these things, and they were successful for me, but…
You know, the person who's now trying to do them is a different person with different, you know, personality and different
kinds of ultimate objectives and so on, and it may not be a fit. But I do think, now that I'm thinking about it, that, okay, explain why you're going to do this or that to somebody is a somewhat useful thing to do, at least I found it that way. Because you start explaining it, and then it's like, yeah, actually, this doesn't make any sense.

You know, why am I doing this?
So I suppose that would be one… one answer to that.
Reflection asks, how much is profit involved in decisions?
For me, probably not as much as it should be.
I mean, as somebody who's run a company for 40 years now, it's, you know, you have to be practical enough
to have the company make a living, so to speak. For me personally, my set of objectives, both for me and for the company, for the people who use our products, for the people who work at the company and so on.
Has been much more about, sort of, do the right thing, do the interesting thing, than do the thing that makes the most money.
It's, you know, for me, pretty much, if there's door number one, it's do something interesting, door number two, do something that'll make more money, I pick door number one 100% of the time.
Now, that makes me probably a less effective business person. It might
mean that I have had a more interesting life, and maybe have contributed more to, sort of, our civilization as a result of that. But it doesn't, you know, if the objective is to, sort of, make a business as successful as a business can be, that's,
that's not necessarily the optimizing path. And certainly, I have perfectly good respect for people who are in business to make money.
That is not the reason, you know, that somebody like me is in business, is to be able to do things in the world that this is the best way to do.
And, it's a… it's a somewhat different optimization. I mean, I… I've been lucky enough that our company doesn't have investors and things, and so I'm not… it's not like I took somebody's money saying, I'm gonna give you a huge return on investment, and then, oops, I'm actually just gonna do things I think are interesting. That's… that's, that's not sort of been our… our pattern, and I think, you know, it's… it's a…
That's a sort of, you know, you sign up for certain kinds of things when you take other people's money to… as investment, and so on.
And that sort of does change the pattern of what you might want to do. Now, sometimes the people who say, I'm going to do this because it's a get-rich-quick scheme, and I'm going to, you know, I'm going to chase the money as quickly as possible.
that… that ends up being a… a smaller thing than the people who say, I'm going to try and do this big thing, it's going to take a while, it's going to be, you know, I'm not… it doesn't not have such an immediate path to money. I think it's,
you know, and I would say from a purely human point of view.
If I look at… I know a lot of people who've made a lot of money doing lots of kinds of things. The people who've done, who've sort of been in the straightest path to money.
I would say, in most cases, not always, but in most cases, that has been less satisfying than people who feel that they've done something that is sort of beyond the money, so to speak. And often, when it has been a sort of race for the money.
then it's kind of like, okay, I made a bunch of money, now I'm going to do philanthropy and do something that I think is meaningful with the money.
you know, I think it is, in my observation, or at least my personal approach, has been, it's better to do things that you think are interesting, that also have the extra sort of feature that they support themselves than to say, I'm going to do this thing that I don't think is terribly interesting,

but I'm going to make money, and then I'm going to do something I think is interesting with it. I think the life plan that goes, that has the feature, I'm going to do
X.
for decades, so that I can do Y afterwards, I have rarely seen that work out. I have seen many, almost, tragedies with that strategy, where people are like, you know, well, I meant to do something really interesting, I was really into this, but I decided to become a
you know, do something very, sort of, that I think is very, kind of, dull.
Because then eventually I'll be able to do that other thing. But they never even tried doing the other thing, so finally they retire.
at, you know, age whatever, and then they're like, now I need to do this other thing. And then they realize, oh my gosh, I don't really even like doing this other thing. I've waited for 30 years to do this, and now I don't even like it, or there's some problem with doing it in the world.
And in fact, you know, as an amateur or whatever, it's really hard to do it, it's really hard to get motivated doing it, it's really hard to connect to people doing it, whatever else. So I think the strategy of putting off what you really want to do
for the sake of kind of, you know, for example, making more money, is usually a lose, and yes, it is non-trivial to take what you really want to do and figure out how you sort of plug it in to ways to support yourself. That is often a puzzle to be solved. I claim it is much more often solvable than people give it credit for, and there's much more of, I'm just going to do this thing that I think is kind of dull.
Because I can see that it is a way to make a living, so to speak.
And I also, I think that the, you know, I will say that the curve, you know, I know people have sort of plotted this sort of psychology level of, you know, the amount of money you make versus how sort of satisfied, fulfilled, happy you are, and it's not kind of more money, happier. And that's certainly been my personal observation, that there's a… there's all sorts of negative values of money that creep in
to do with, well, interactions with the world, interactions with other people, sort of expectations you set for yourself, and so on. But there's positive value to money that allows you to kind of spend your time doing what you want to do, rather than spending it doing things that you don't want to do, which, if you have money to pay other people to do those things, that's a win. And also, just the ability to do things where there's some project that's going to take
a bunch of resources, and you can either go spend a decade going around the world kind of asking other people to put up the money to do this thing that you want to do, or just spend your own money on it. And, you know, if it fails, it's just your problem. It's not, you know, you don't have to explain to other people, oh, it's not going to fail, it's not going to fail, you just have to explain that to yourself.
Let's see… Okay.
Dr. Matt is asking, can you put into words what things make you like or dislike a book cover before making a final decision?
Good question.
I mean… a lot of…
there's a certain mood that different book covers produce. And it's like, is this book kind of a very erudite academic kind of thing? Is it a thing for the masses? Is it a, and then, is it… does it sort of say the right thing?
So, for example, I mean, I've produced quite a few books

put all sorts of covers, and some, I think, were a success, some I think, were not such a success. There's some where it's like, the book's been successful, but I don't really like the cover very much.
My book about ChatGPT was an example of that. It's now translated into many languages, and it has many, sometimes very, very bizarre covers, because the publishers in those different languages get to pick their covers. But we made that cover, you know, we published that book in two weeks, which is sort of a remarkable time for book publishing, and that cover was made very quickly, and I don't think it's particularly good.
And, it doesn't really… it… it doesn't… Communicate either a clear mood, Or…
or it isn't kind of interesting, if you look at it. So, an example of a cover I rather like is a book called Idea Makers, which is a collection of, kind of, historical biographies that I put out, actually, nearly 10 years ago now. It's a simple cover, but it has, kind of, you know, it's got… its background is a bunch of signatures of the various people who are profiled in the book.
And I think it's kind of elegant, and it's kind of conceptually nice, and it sort of lightly communicates what's in the book, and I like that cover. I think that,
in, you know, sometimes…
there are certain expectations that book covers set in terms of, as I say, what type of a book is this? Is this a book that is sort of intended for the general person? So, for example, right now, I bring this up because I'm picking a cover for a collection of things I've written about philosophy, and you know, the first step is, what's the title of the book? And it was just going to be, kind of. philosophical writings, which I… I realized, wait a minute, this is really lame. So it's… it's… it's now kind of what ultimately is there, and other foundational questions.
And so that… that title forces a certain kind of cover, and it also is a book which I think has some appeal to sort of the general bookstore audience, and that kind of determines a certain sense of
You know, big words on the cover, so to speak, rather than sort of elegant.
you know, stripe, where it's kind of, like, more like an academic thing, where it's just sort of the words printed on the cover. There's a few thoughts, but… but I think in,
there's a certain… does the cover mean something? Does it kind of meta-communicate the right kind of thing about what kind of a book this is, and who might be the audience for this book?
And, you know, I suppose a big no-no, as far as I'm concerned, is, wait a minute, this cover has something on it that's just… means the wrong thing. It's just a piece of, sort of, clip art that somebody put on there, and it's like, yes, but…
this book is really about something completely different, you know, that was sort of illiterate to put that illustration on the cover. And I've certainly seen plenty of books where I can tell, you know, some
somebody, some publishing company or something just sort of said, well, I think I know roughly what this is, and they picked up one word from the cover, and they sort of keyed in on that, and that's… one word from the title, I mean, and they've keyed in on that, and that's what the… that's what the whole cover is, and it's like, no, that isn't really the point of this book.
Let's see…
The dice. Ask the question, how do you generate a truly original business idea in tech nowadays that won't be covered by AI long-term?
That's a good question, and many people are struggling with it.
I think that… there is…

you know, one thing to say about that is make hardware. I mean, that seems to be one thing that lots of people are trying to do,
I… You know, hardware has a different kind of threshold than software.
I would say that there's plenty of the way that software works.
the way that it's… you know, I would say that the design of software is something that is not sort of a… a… you know, AI can trot out a design that's like has been seen before. And I, you know, when I see companies that say, 90% of our code is written by AI, and I look at their user interface, and it's like, this is really stupid.
And it's like, you know, some AI made this interface, and some human was like, oh yes, the AI made it, it must be great.
well, you know, that's a place where, you know, it's an interface for humans, and yes, the AI can kind of trot out what it's seen before, but really understanding the essential features of the interface, maybe that's not a, you know, that's something which is still, particularly when it's an interface for something new and different, where there isn't sort of a template for it before, that's a place where humans are going to be relevant.
It's also true that there are often businesses which depend on, kind of, features of the world, like distribution channels, regulatory compliance, things like this, which are, you know, they're not things where the AI, kind of, on its own, you know, walks into the regulator's office and gets itself correctly regulated. Maybe it can file the paperwork for that and so on, but there's a different kind of thing in the world that's necessary to get
Get that business to work.
I mean, I would say that it is a challenge right now, particularly in the software area, to see, you know, kind of what
what's there, where kind of a lot of kind of low-hanging fruit software, you can go straight from the idea, and it's a very enabling, if you're a kind of a product manager kind of person, you can go straight from your idea to something you can implement. I mean, this is what we have enabled with Wolfram Language for the last, you know, nearly four decades, that people who have kind of a technical idea.
A kind of computationally formulatable idea
Can, if they're using our technology, and they're fluent in it, can go from that idea to working out that idea in a very automated way.
That's something which, for people who are doing, sort of, more general product management and building, sort of, in a sense, less technical kinds of things, are now able to do with AI, and that's… that's…
terrific, but, you know, then it puts more pressure, in a sense, on, well, it has to actually be a good idea. It's really the idea that counts. The simple, oh yeah, just make a website that does that, is, you know.
has become much more straightforward. I mean, I'm sure, you know, if Twitter was being made today, you could have an AI make that basic website its original form. I mean, it's got much fancier later, you know, very easily, but you just have to have the idea of doing it. And you have to, you know, sort of realize that that wasn't kind of a crazy thing, which it looked like to many people at the beginning.
So, it's, You know, I would say my general point about ideas and tech is…
do something where you know about it. Do something where you want to use it. You know, whenever I see people who say, I'm going to start this company, it's going to make this thing that

I think there are other people who are going to use, I've done a business school study, and I think there are people who want to use this. You say, well, are you one of them?
No, it's not me, it's, you know, I'm making it for the customers type thing.
I… I find… in what I've seen, that rarely works. It's much more, there's a thing that I'm interested in, I really wish this product existed, I'm gonna go build it for myself and for the world.
that's a much more successful premise for things. Plus, you've already got potentially years of pent-up experience in thinking about that particular kind of thing. It gives you a big advantage relative to everybody else in the world who just picked up their AI that morning and are now trying to implement the thing.
So, you know, I know for myself, that's very much the case. You know, I built Waltham Language and Waltham Alpha and so on, because I've wanted to have them, and I'm a big user of particularly Waltham Language, and you know, that's, that's a driver for both
Being motivated to build it, knowing what to build.
and being able to kind of have the right sort of picture about what to do strategically going forward is because, you know, I'm a user, so to speak. I'm not just saying, I'm making it for other people, I don't really know what they want.
Let's see… Trey is asking, how much does design matter in whether a product succeeds?
I mean, I think it matters a lot, but there are certainly examples where the design has been crummy and the product succeeds despite it.
I mean, I think that, you know, if the functionality is
is strong enough, then maybe you can succeed in spite of bad design, but I think that good design certainly helps. Now, there are different kinds of design. There's functional design, and there's essentially industrial design, graphic design, and so on.
I would say that there are products and product categories where the sort of industrial graphic design side of things, the… the people in that domain, frankly, don't notice.
And it's always frustrating to somebody like me, who pays attention to that kind of design, but it's, I don't know, if it's, for example, some kinds of, I don't know, academic books, for example, they look cruddy.
And… yet…
That's fine. The target audience doesn't even notice. And to me, it's like, that's a horrible piece of graphic design. But it's like, it's okay, it's, you know, it's got the right content inside it, it's all good.
Now, would it do better if it had better graphic design? I'm not sure it would make so much of a difference. But then there are other cases where, you know, the way people think about a product is affected by its design. I mean, there's a certain meta-communication about design, I think it's less true today than it was in the past, but if you go to a company's website, and the thing looks really crummy, and looks like it was built in the 1990s or something, then you think something about that company.
Whereas if the… if the design is… sometimes if it's very… kind of… it's… it's very flashy, it can defeat itself.
But, you know, it has a certain meta-communication. I mean, it's,
I remember when one of my kids was, was quite young, talking about things like design. It was like, it was, why should I learn to handwrite things? You know, I can just type anything I want. And I made the point that if somebody sort of sees your handwriting or signature or whatever else it is, there's a certain sort of meta-communication about you that it makes. And I said, you know, that… I forget.

the exact age, but, you know, the meta-communication that it makes about you is that you're, you know, 8 years old or something. And that can… that… at the time, with that particular individual.
convinced, you know, a little bit more development of, oh, maybe I should learn to write in a way that doesn't look like I'm 8 years old type thing. And I think it's the same thing with companies, and sort of graphic design for products, that, you know, as a meta-communication, somebody put the effort into making this a nice design, and so on, and that means, well, I should probably take this product more seriously.
As, as something that, could, would be, would be worth looking at.
Let's see, Avery asks, how do you decide when to build what customers are asking for versus introducing something they didn't know they needed?
Well, I may be very bad at this level, because I build things that I think should exist.
And… that I think will be useful to people, because I know they will be useful to me.
I certainly know people who say, go ask the customers what they want.
I would say that my experience has been that the customers usually don't know what they want. Because if they, you know, they'd be starting companies and building the things if they really, really knew what they wanted. It's just like, give me, you know, they say I… that sometimes they'll… it's much better to watch what people actually do with a product than to ask them what they want.
In other words, if you see that they always do this, and they always get confused about that, those are things you should pay attention to.
And, you know, sometimes people are always saying, oh, I wish the product did X.
You should listen to that. Once they know the product, and they have some idea what it should do, then… then, you know, have it be, you know, it should do X. You know, I can tell a story about my late friend Dick Feynman, well-known physicist. When I was first working on building, kind of, mathematical computation systems, early 1980s, and late 1970s, actually, Dick Feynman had all sorts of opinions about that. And, oh, it should do this, and you should be able to do that, and so on, and so on, and so on.
And it's like, you know, he's a bright guy, and he'd done plenty of, sort of.
Things like mathematical calculations by hand, but somehow it was the kinds of things he was suggesting didn't fit into the kind of framework that
was buildable at that time, and that I ended up building. And so, those kind of suggestions, they may have been, you know, they were clever suggestions at some level, but they were clever off in some corner that wasn't relevant to the main thing that I was building.
And I think that's a pretty common thing that you see in suggestions. Hey, wouldn't it be good if it did this? Another thing that happens is, you know, you ask people for suggestions, and they'll make up a suggestion, and you say, well, would you really, really use that?
They think for a bit, and they say, well, it'd be nice to have.
You know, and then if you tell them, and I have had this experience, if you tell them, you know, 6 months later, or whatever, oh, we implemented that. And they say, oh, really? That's interesting. Did I suggest that?
You know, they've completely forgotten it. It was a kind of a manufactured idea that wasn't really a deep thing. Now, there are cases where, when people are using something, and you see them always kind of have to dance around and do this and that and the other, and it's a horrible workflow, that's something you should pay attention to. And if they say, oh, I always get held up on this.

then that's an issue. Or if they say, I don't know how to do X with your product, and you plainly know that your product can do X, well, then there's probably either a communication problem, or more likely a user experience problem, that didn't let them know that you could do X with the product.
But…
you know, there are certainly people who will go and say the right way to handle things is go survey your customers, ask them what they want, and then build it. I think that's a horrible approach.
I mean, you know, maybe that is…
saying that it's a horrible approach is somewhat filtered by my own reason for building products, which is because I want to build the product. It's not so I make money by selling it to this or that group of people. So maybe if you're optimizing for the money, so to speak, maybe it makes sense to just go survey users and say, do you want this, do you want that, do you want the other thing?
I mean, I suppose a version of that that we've never executed, but that's somewhat common, is that a company will start in a very much more services-oriented way, and say, we're going to do a bunch of, you know, consulting, basically, and we're going to see what we end up building as part of our consulting effort, and then we're going to pull that back
Into what we have as a product.
Can work.
I… that works less well than I think you would expect it would work. I know for our company, we have a small consulting operation, actually two different ones, and different levels of project. And I would say that the… the sort of feedback
From those groups of, oh, and now we're going to take what you learned from these consulting efforts and pull them into the main product, has happened rather… very rarely.
It's like, well, we solved this particular problem for this particular customer, and we did it by building this particular tower, but it isn't very general. And at best, you get some kind of very dilute kind of general direction from that, but not something much more specific, at least that's my experience.
And although there are companies that have, you know, have emerged.
From, oh, we were doing consulting, and we needed this particular thing, which we built for this particular customer, and then we realized everybody needs that thing, and now it turns into a product company.
Let's see…
XYZ is asking, what kind of business would you be excited to see someone start? I always like businesses that make use of our tech, and also businesses that make use of science we've developed. Those are… those are always, I… I feel like, you know, we built this… this…
tower, and it's like, start building from that tower. There's a lot of really cool things to be done, and it's, there's probably been less of that done than I think should be, and those are things that I always like to see happen, and I've…
been an advisor to many companies that have done things like that, that have done all kinds of interesting things, and that always… I always like to see that.
Let's see, there's a very long question here, which I'm not sure I can parse all of. I should be, I need an LLM,
Boy, okay, let me read through this. It says, I'm a PhD student sitting on some new symbolic regression technology, which I hesitate to publish, publish uses… uses of it in research, and it's a little more powerful than state-of-the-art methods, but allows completely new use cases.

Originally, we wanted to make it open source, and then build a business around the open source. But, with LLMs.
We hesitate to publish the code, as anybody can regenerate it in the future, and a couple of prompts.
If the code is sucked into the training data of large companies. We want to make sure this project is viable and can be maintained long-term, meaning that at least one person needs to be paid. Would you recommend going the fully open source route, or maybe a closed-source GUI? What are your thoughts?
Well, you know, I have to say, I have known many people who've done many things that are sort of out as open source projects. They usually are unhappy in the end.
Occasionally, they've managed to navigate things to, for example, raise a lot of money around their open source thing, and that's good. Usually, open source projects are that if it's one person who sort of gives it out to the world for the… for, you know, to enrich the world.
The world usually doesn't pay them back very well, and they usually are pretty bitter and unhappy at the end of it.
If the reason the thing is open source is it got built by some company, and the company had no idea what to do with it, or it wasn't really in the business direction of that company, they said, well, let's make it open source, because then other people will help a bit, and we get some… some kudos for making it open source. That's a completely different reason, and that's, I think, not the situation you're describing, but that's a very common source of open source, so to speak. I would say that the, you know.
it's sort of an abdication. If we… you've built a thing, you don't really know what to do with it, just make it open source, and hopefully somebody else will pick it up, and you've abdicated, so to speak. I think… and that's what companies that make a lot of things open source, that's a… that's a typical thing they're doing. For an individual who's built something, it's like, well, that's a…
you know, if… if…
if you want to make it kind of a long-term viable thing, I think you have to have some way to sell it. And if you think that what you've done is a bunch of techniques that would be easy to replicate if somebody saw all the techniques, well, then I think you've kind of answered your own question, that if you… if you want to make that into a business, you know, the only way you make that into a business is this kind of story of, oh, you make the thing
thing, and originally a common story was you make the software, and it's open source, and you make money on services around the software. But of course, that drives the idea of, well, make the software, don't put in the real bells and whistles that make it really easy to use, because then nobody will want the service. So you get this sort of counterproductive thing, and then a really common cheat, I would say, because I… it always kind of
It's always disappointing when I see that. You know, people say, we're very righteous, we're making this open source.
oh, by the way, we've made this closed-source version, and if you actually want to use it for real, you need the closed-source version, and it's actually very expensive compared to what somebody would charge with just a regular thing. So the open source thing just becomes kind of a flag you're flying, a sort of righteousness flag that you're flying, but it has nothing to do with the actual product that anybody could use. I don't think that's a, you know, that's again a different play.
relevant as sort of a marketing play for certain kinds of companies and so on. I think that

You know, there's a challenge when you have a component like a symbolic regression package, for example. It's like, what do you really do with that?
You know, that's not an easy thing to sell, because it's not something where people are very rarely out in the world, you know, saying, I want to buy a symbolic regression package. Symbolic regression has particular uses, and people who need it need it, but I'm not sure that they know that they need it.
And I think that's, again, a complicated thing. So it's not obvious how you, you know, if you put up the shingle that says, we have this particular, in a sense, you know, component thing. That people will flock to it, and that means that if you try to make it into a business, what you're doing is much more, sort of, outbound sales, where you're effectively doing consulting along with selling the thing.
Which is a possible model, and I think I actually know one company that does exactly that with symbolic regression, and has had a reasonable level of success selling to various large corporate clients, and so on.
I think that, I mean, I don't think this is… I don't think it's a trivial situation. If you have sort of a component thing where it isn't, like, everybody knows I need a…
you know, some category of thing. I need a… Oh, I don't know,
a piece of software that does something that does image compression. Not a good example, because that's not… that's something that became quite generic. I mean, I need a thing where It does… the question is, what workflow does it contribute to? If there's a whole workflow where people say it's the symbolic regression workflow, then you've got a thing to sell. If symbolic regression is one piece
of some other workflow, then the thing to think about is how do you fit into that workflow? How do you market into that workflow? And I think in that particular case, it's all about, kind of, modeling and so on.
And, you know, I say in modern… okay, another thing to say about modern times, and a little bit of the, you know, we're open source, or we're not, or whatever else, is anything that's server-based, nobody even really asks if it's open source. It's just, here's an API, people can use it.
So, you know, that's another approach, is to say, okay, there's an API for doing symbolic regression, the thing is running in some cloud provider services, and, you know, feed your data in.
You can say, well, you can have a private instance of it, so you can have a containerized thing, so it's not like you get to see the data that everybody's feeding into it, but it's a thing where you say, we're providing an API.
Now, in some cases, like for sort of frontier LLMs and so on, that's… there's a… there's an excuse for that, which is, at least right now, those things need lots of memory and fancy GPUs and so on, and those aren't things people typically have under their desk.
So it's something which makes sense to go and do in the cloud. Similarly, for a long time, things like, you know, search engines, although we could have done those more locally, people kind of had the idea from very early on, that's a thing that's so big and complicated, it should be done in the cloud.
I think if there's a reason why, sort of, symbolic regression makes more sense to do in the cloud, if you're having to, sort of, store lots of existing data, or lots of knowledge of existing models, or anything like that, then that's a great reason to kind of have it be an API-based service, and it may very well be that the, you know, that the use cases are such that the API is a fine thing, in which case you've kind of solved the problem.

You know, you can say, nobody expects you to be grinding compute for free in, you know, in a cloud provider. So that would be my immediate suggestion on that.
And, it's,
There's probably more to say about symbolic regression
And how it relates to our ecosystem. I mean, the,
making something that plugs into Wolfram Language that is a distribution channel for things like that.
that works quite well, and that's, that's probably a thing to think about. And that's sort of providing an API into Orthin Language that lets you access, the algorithm you've built.
Let's see… Harry asks.
How did you choose where to live, or is it more that your work mostly chose it for you?
Well, for me personally,
the answer is my work didn't choose it for me, because I became a remote CEO in 1991, so I've been kind of free to go wherever, ever since then. I mean, my…
My wife's, kind of, decision procedure
25 years ago or something, when we decided to move to the Boston area, which may or may not have been a correct decision procedure, was kind of like, what's the place in the world where we kind of know more people than anywhere else? And, the, the Boston area ended up being the winner for that.
I would say that, had Wolf Malfur existed at the time when we were making that decision, I would have looked up a bunch of things that, I didn't look up, like the sort of relative size of Boston and Chicago, and this and that and the other. We were living in the Chicago area before that. And, you know, I might have,
Might have had slightly different decision-making, and we also were in the, you know, want to find a place where we can buy land, build a house, and so on, and,
that was… that involved, kind of, some degree of poring over aerial photographs and trying to figure out, you know, where are the chunks of land you can buy, and so on. So my case was probably more extreme than many others. I would say in today's world.
there's lots of opportunity for remote work. Not everybody likes remote work, not everybody fits in with remote work. I mean, I myself am probably a quintessential remote worker, because even when I was working at universities and other places, and, like, I had a fine office, I would not go in there terribly often. So I was somebody who was probably
fated to be a work-from-home person forever. I mean, I… back from even in the, early, well.
late 1970s, beginning in the 1980s, I was always finding that I was, you know, I would go into the office, and I maybe would work there, but I would also just go home and do most of my work there. In those days, it was always kind of amusing, because I would have a computer terminal, and I would take a computer terminal home.
and I would connect it to a phone line.
And, you know, I was always amazed when I grew up in England, no phone calls were free. So even local phone calls cost money. But in the US, it was kind of like, it's so cool, local phone calls are free.
So I simply connected a phone to my computer terminal, and connected, you know, and dialed up a computer, and I would just leave it dialed up forever, and for months. And, you know, I would come home, and the computer is still running, and it's all connected, and so on, and why am I going to dial it up again when I can just leave it running?
I have to say, the,

Okay, a piece of trivia story that the person who was kind of the administrator at the theoretical physics group at Caltech, where I was working, was also the person who was sort of administrator for
for people like Dick Feynman and so on, she had, before she had been in the gig of doing administrative support for physicists, she'd worked for the phone company. And at some point, I mentioned to her that I was doing this thing about just connecting the computer terminal, leaving it connected, and she was, like, horrified. She said, don't you know that's going to send, you know, error signals into the
the plant, and so on, and, you know, you shouldn't be doing that. That's kind of cruelty to the phone system.
I have to say.
A little while later, I was a consultant at Bell Labs, and I… I didn't get the vibe that this was cruelty to the phone system by that point, at least, which is only a couple of years later. I think the way that, you know, in any case, the way that virtual circuits work and so on, I just don't think that was a… I think it was an overstated cruelty to the phone system, maybe from an earlier time.
But anyway, so… so I think,
You know, if you are a person who sort of has the internal motivation and the kind of concentration
to work from home, you can work, you know, you can live anywhere you want. And then it's calculations like.
can I live in a place where I want to live, and where my family wants to live, or where, you know, I'll be able to do things that I want to do, and will I be able to, you know, afford the things that I want to afford? And, you know, it's like, well, you can get a, you know, for the price of a tiny apartment in New York City, you can get a lovely house somewhere else.
But if you really want the things that are in New York City, well, it doesn't do you any good to have a house out in the middle of nowhere, so to speak. So I think it's a, the,
It's, you know, it's a… it's a quite,
quite specific thing. Now, you know, the thing that always surprises me, like, I've lived in the Boston area for…
What is it? Since 2002.
So 24 years.
Two things amuse me. One is that people who are just now realizing they live in the Boston area, so you can invite me to some event that's in the Boston area. But there are also people who I run into, even
you know, in the last, probably, week, I've run into several people who are like, oh, do you live in England? And it's like, no, I haven't lived in England since 1978.
And why on earth would you think that I lived in England? It's like there's nothing, you know, other than the fact that I kept my British accent.
But people in America have accents from all over the place. It's like, no, I haven't lived in England in… what is it, I can't even do the math. It's 48 years now, or something. So it's,
It's strange how slowly people discover, you know, maybe the local people, if one knows one's neighbors or something, the local people know who… that one's there, but the sort of the bigger community of people that one might interact with doesn't.
I've always found that strange, that, you know, in the beginning of the 1990s, I lived in the Bay Area in California for a year and a half.

And I don't think, sort of… I think nobody noticed I was there, so to speak, or remembered that I was there until long after I'd left there. And then they… it was… it's just a sort of a strange thing.
Let's see… Daniel is asking, how do you know when you're being persistent versus simply stubborn?
I suppose my main criterion is, do I really understand What the issue is.
You know, sometimes, I find, with many people, including myself.
That I will be adamantly, of course it's got to be this.
And, you know, it's like he doth protest us too much, so to speak. It's like, if I'm that adamant, it's usually a signal, and I know that in myself, and I've certainly seen it in lots of other people, it's usually a signal you don't really know why you're doing this. It's just… you're using your forcefulness
as a way to cover up the fact you really don't know why you're doing it. So for me, if I feel myself being stubborn about things, and being, it seems, sort of irrationally stubborn.
then I'm kind of like, let me really understand what's the foundation of this, if I actually know what it is. If I really know the foundations.
then, yes, I might look to be stubborn, but I see myself as being persistent, and I don't make mistakes that way. If I've got, you know, if the idea is sort of
based on bedrock, and I'm building from that, and I really understand what's underneath there, as opposed to just, well, I'm doing this because I kind of decided to do this one day, or because somebody convinced me to do it, and now I'm bought into doing this, but I can't really explain why, and I'm going to be really stubborn about it. That's, you know, that's when you should re-examine that question, at least that's my point of view.
Ryan is asking, how do you avoid becoming a prisoner of your own past successes?
That's an interesting question, and I think it requires a whole bunch of force of will, in a sense. I mean, I've seen many people who had the good fortune and bad fortune of having successes early in their lives.
And, I mean, I was, I suppose, fortunate enough to have some success early in my life, too. Somehow.
It's, I'm always interested in the next hill, so to speak.
At any time, the project I'm doing is always the one that I'm most excited about. And it's, you know, it's like I always want to get to the top of the next hill.
And it doesn't really matter whether the next hill is bigger than or smaller than hills that I've gotten to the top of before. And I think part of the reason for that is, you know, for myself.
I'm not…
particularly driven by, sort of, other people's reactions to the things I do. I mean, it's nice when they appreciate them. I get more out of the fact that if
They appreciate what I've done, I feel like they're going to have a happy time following on from what I've done, and that gives me a warm, fuzzy feeling, rather than them appreciating it for the sake of saying, hey, that what you did is really great.
I… I guess I don't pay
you know, for whatever reason, I have… don't pay much attention to the, it's great, it's terrible, feedback from the rest of the world. Now, that's, you know, that's partly because… why is that?
Well, it's partly because I'm sort of internally motivated to do the things I want to do.
It's also because, I have to say, in, you know, from early in my life and career, a lot of things people said, that's great. It's like, no, it isn't. It's kind of blah. Or, that's terrible, that's a crazy thing, doesn't make any sense. That turned out to be the biggest win.

And I knew it was going to be the biggest win, and I was just like, look, I don't really care that you… it's something different from what you've seen before, and so you say, oh, that's, you know, that couldn't possibly work, or whatever. It's like, yeah, whatever. You know, it's… it's… I don't… don't worry about it too much.
And so I think that that kind of… you're doing things for your own internal motivation reasons is a good way to not kind of be a victim of your past success, because, you know, if there's something you're now motivated to look at, you're going to be motivated to look at that, whether or not you're looking over your shoulder at the taller hill that you were… had climbed before. Now, you know, for me.
it's like, I don't really rate, you know, the things I'm doing, have done, and so on. I don't say, this is more important than that, and that's more… I don't know, I don't even know. I don't think anybody can know. You know, in my case, things I've done in science and technology and different areas of science, and so on.
It's, you know, rate these things on a 20-year timescale, 50-year time scale, 100-year time scale, 1-year timescale, very hard to tell.
So…
even if you wanted to do it, you couldn't tell, and why do it? What's the point, so to speak? Now, sometimes one will have a situation where I've seen people get into this trap many times, where they get to the point where they're sort of at the top of some field.
And then, they're like, I'm gonna work on some other field.
And they are, like, like, they're kind of not used to climbing the hill from the bottom again.
I think I've been lucky in that I've climbed many hills from the bottom.
And I… but I have some methodologies for doing it, and I also have the confidence that I can climb these hills. And so it's not kind of like, oh, why should I start climbing a new hill when I've got an existing hill that is kind of… I'm already at the top of, so to speak.
well, it's because I'm pretty sure I can climb the next hill, and I think it's interesting, and it's, you know, I think one of the things I've noticed, and I've made this mistake once in my life myself, actually, is projects you think are easy, because, like, it's… I've done this before, it's going to be easy.
It's… those are the ones that do the worst.
I mean, I would say in the outside world, a good example of that was Steve Jobs at his company, Next, between his first round at Apple and second round at Apple. I knew him at that time, and he was very much a, I've done two computers before, I can do a third computer, and it didn't work out so well. I mean, in the end.
you know, it got absorbed back into Apple, and that story ended up very well. But, you know, at the time, it was like, it's kind of easy. Now, I had the same experience back in the,
when was it, in 84 or so? I had built a big software system, built a company around it, and I was trying to make another software system that I thought was kind of a useful thing. It was actually a C interpreter, C language interpreter environment in 1984 or so, and it would have been a good software product.
But I was like, I know how to build these things. It's, you know, and I hired a bunch of people, and sort of started building it, and I really wasn't… I didn't have the emotional investment in it, and it wasn't a success. I eventually sort of pulled the plug.
And, you know, it was sort of too easy. And yes, from the hill that I had already climbed, it was pretty easy, and that was the mistake, so to speak.

I think when it comes to companies, that's a different dynamic. You know, a company has something that it's successful at doing, should it do something different.
Often, the honest answer is no.
You know, you try and do all kinds of things. You make sort of a special project to do something different. If that special project is comparatively modest in scope initially, you can kind of feel out, is this really going to go places? You know, for our company, like, Wolf Malpha was a special project, so to speak.
That became a real thing.
But it was sort of started as a sort of special project that was off on the side, and the mainstream of what the company wasn't going in that direction. I mean, companies tend to end up with a considerable degree of conservatism about what they do. Usually, the, we're going to do something different, has to come from the top, and has to be a kind of a forced march of leadership, so to speak, to go in a different direction. It's not usually something companies naturally
do. I mean, I think our particular company, you know, over the years, has gotten used to the idea that we do new things. That was after we've done a few new things and they worked out, you kind of get into the kind of the character of the company that we are going to do new things, and so that's a, that becomes a thing where it's easier to do a new thing later on.
But it's not always a good idea. I mean, we've done new things where we put some effort into it, and it didn't really make sense.
And, you know, there's sort of core business that does make sense, and why not pursue that?
So, I think it's a, I think that's a,
That's an issue, but… but in terms of people, another trap is you do a thing, it pays pretty well. anything… the things you look around to think about doing that, you might be a lot more interested in don't pay as well, and it's like, do I really want to sort of jump off this place where I've got to and go back to something else? You may not be able to. You may have, you know, mortgages to pay, mortgage payments to make, and
you may have, you know, things you need to pay for in your life that simply don't… that simply have locked you into that position. I mean, this is a reason why, sort of, sometimes people find it, you know, do things early in your life, so to speak, when you don't have all those commitments, or late in your life when you don't have those commitments, or whatever. And there are periods of time when people do tend to get quite locked in by the details of their circumstances.
And, that's, you know, that's… that's… that's a difficult thing. And I think, you know, if that's what, you know, I've seen plenty of people where, at some moment in their lives, they decide, I'm going to do something completely different.
And, the… you know, and maybe they have enough savings, maybe they're whatever, that they can make that jump, or maybe they simply decide
you know, I don't care about that level of standard of living, I just want to do this other thing. Or maybe the other thing involves, you know, living in a place that is… doesn't cost as much, or whatever else. And, you know, I have to say, I have usually seen that work out rather well.
when people, you know, in their, you know, mid-30s, mid-40s, whatever else, it's like, I'm gonna do something different, or at any age, actually, but I'm gonna do something different.
once you've done something for a while, I think you know yourself much better, and you have a much better chance of saying, okay, if then you've decided you're gonna do something different, that you, you know, that you are successful and fulfilled doing it. I mean, I think that it's the

same thing as people who go, you know, to college, graduate school, whatever, and they go straight from this to that, and it's like, well, that was a natural path to go.
But they don't really know quite why they're there. But if they were out in the world for a few years, and then they decide, I'm going to go back to graduate school, because I really care about learning about this or that thing, they often have a much better experience and much more success in that area.
Let's see…
Luke asks, what's the best example of a decision that paid off 20 years later.
Oh gosh, I've…
made many decisions out. One that comes to mind, I don't know why, but it's IPO season right now. I never took my company public. I thought about taking the company public in the early 90s, and we would have been able to do a fine IPO at that time. I decided not to do that.
it was a good move. My life has been better for it.
And I think what we've achieved as a company has been better for it.
I probably made less money, significantly less money as a result, but it's not… I don't care.
I'm much happier for the things that I did decide to do.
I think the, I mean, just a zillion decisions that we've made in terms of our products, and sort of how… how we've architected them, and the kinds of lack of compromise that we've made in sort of the functional design of products, much, much, much of that stuff has paid off decades later.
I mean, the same is true with, another thing I've done, is when I do science and things, I try to pick a particular topic, a particular thing I'm figuring out, I try and figure out as much as I can about that thing, I write it down as clearly as possible, and I move on.
And, you know, the fact that I've sort of excavated these things in a, in a slightly complete way I've… that's been a big win. It's not like I'm continually having to go back to that thing and redo it and redo it. It's like, it was done, now I can build on that. Same with the functional design of our products, that you do it once, you do it right.
And then you can just build on it forever. And that's the thing where it keeps, sort of, paying dividends decades later. And that's,
Let's see, there's a question here. How do you know when an opportunity is a distraction in disguise?
Yeah, well, those happen. You know.
I try to be fairly open-minded.
In the sense that I'll try things, I'll meet with people, I'll do this, I'll do that. And then I kind of say, well, okay, what came out of this? And…
you know, the… when do you sort of pull the plug? When do you stop?
The earlier you can stop, usually the better, but you don't want to be in a situation where it's a what-if. I just wonder if I had pursued this, or if I'd done that. You don't want to be in that position. You want to be like, I looked at this, it didn't make sense to me, I'm out of there.
Distractions, yes, they are, it takes a considerable force of will to not get distracted.
And particularly when the things you're trying to do are hard.
And for me, you know, even at a sort of small scale, it's like, hey, I'll do some easy stuff here, and then by that time, it's, you know, time for me to go to sleep, or whatever, on a particular day.
And that's… I'm always…
kind of disappointed when that happens. You know, it takes… it takes, kind of, like, you really have to dig in. You're doing something hard, it really takes, kind of, force of will to go and say, I'm going to do this. You have to be very motivated to do it.

And I think it's, you know, it's too easy to have kind of a, a distraction where,
that takes you away from the hard thing you're supposed to do. Talking of which, I'm being reminded that I have something I'm supposed to do as part of my day job.
It's,
I think I have to go off and do that. And this is hopefully not a distraction and surprise and disguise, but an opportunity that I'm going off to… to take a look at.
But, well, thanks for joining me, and thanks for lots of questions I didn't manage to get to today, but I look forward to getting to them at another time.
Thanks, and bye for now.