Episode Book

EPISODE #5555

Five Machines That Peaked at the Wrong Moment

PUBLISHED	25 September 2026 at 17:21 UTC
DURATION	27:47
LISTEN	myweirdprompts.com/episode/machines-obsolete-before-launch/
HOSTS	Corn, Herman
SCRIPT MODEL	deepseek-flash
VOICES	chatterbox-regular (chatterbox-local)
PIPELINE	V5.2
BOOK GENERATED	19 October 2026 at 17:37 UTC

SYNOPSIS

In 1954, engineers on two continents began designing the fastest passenger aircraft ever attempted. They forecast a market of 350. They built 20. This episode walks through five machines and systems that reached the absolute summit of their paradigm — the most expensive, most painstakingly engineered versions ever built — and were overtaken almost immediately by something else. Concorde and the Tu-144. Buran and Energia. Iridium. The Cray-1. The SS United States. These aren't stories about failure. They're stories about the opposite of failure: machines that were genuinely the best ever at what they did, and it turned out that didn't matter. The engineers reached the summit of an entire paradigm just in time to discover everyone else had started climbing a different mountain.

TRANSCRIPT



Corn

In nineteen fifty-four, engineers on two continents started designing the fastest passenger aircraft anyone had ever attempted. Twenty-two years later, twenty of them entered service. The forecast had been three hundred and fifty.



Herman

And every airline that wasn't state-owned had already walked away by then.



Corn

Daniel's got a whole thing this week about exactly that feeling. He wants five specific examples, machines and systems and products, not broad categories, where a technology reached the absolute summit of its paradigm. The finest, most expensive, most painstakingly engineered version ever built. And then got overtaken almost immediately by something else.



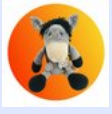
Herman

And he wants the absurdity of the timing front and centre.



Corn

Right. He's asking for a timeline on each one. When development began, how much money or effort went in where that's even knowable, when it entered service or peaked, and when the replacement made it irrelevant. What made it impressive, what engineering problems got painstakingly solved, what displaced it, and why the transition happened so fast. He says to prioritise the cases where the contrast is most dramatic. Years of work, enormous resources, and then only a few years at the frontier. Ideally shorter.



Herman

He's not asking for failures.



Corn

No. That's the thing. He's asking for the opposite of failures. He wants the machines that were the best ever at what they did, and it turned out that didn't matter. His phrase is that the engineers reached the summit of an entire paradigm just in time to discover everyone else had started climbing a different mountain.



Herman

That's a good frame.



Corn

So let's climb five mountains that turned out to be the wrong ones.



Herman

Before we start, I want to nail down what this pattern actually is, because it's not the usual story about technology dying.



Corn

Go on.



Herman

The normal story is that something was worse and got replaced by something better. That's not what we're talking about. In every case Daniel's pointing at, the machine that died was the finest example of its kind ever built. Nobody built a better ocean liner than the SS United States. Nobody built a faster airliner than Concorde. The Cray-1 was the most powerful computer on earth and it was beautiful.



Corn

So what killed them?



Herman

The paradigm moved. And there's a distinction I want to keep straight the whole way through, because it matters for how you read these stories. Technological obsolescence and commercial obsolescence are different things.



Corn

Explain.



Herman

Concorde flew passengers for twenty-seven years. Technologically it was never obsolete. It did exactly what it was designed to do, right up to the last flight in October two thousand three. But it was commercially dead almost from the day it entered service. The SS United States sailed for seventeen years and was killed by the jet within a decade of its maiden voyage. Meanwhile the Tu-144 and Buran had almost no service life at all. Those are short. So the pattern has two flavours and we should be honest about which is which.



Corn

Which is the more interesting flavour?



Herman

The one where the machine works perfectly and the world stops wanting it. That's the one that's strange.



Corn

So five cases. Give me the list.



Herman

Concorde and the Tu-144 for supersonic transport. Buran and Energia for the Soviet shuttle. Iridium for satellite phones. The Cray-1 for supercomputing. And the SS United States for ocean liners. With the Boeing 2707, Saturn V and the N1 rocket as supporting



Herman (continued)

characters.



Corn

That's a lot of dead rockets.



Herman

It's a lot of dead everything. And there's a mechanism running underneath all of them that I want to flag now, because it explains most of the carnage. Long development cycles lock in assumptions about markets and competing technologies that are guaranteed to be stale by the time the product ships.



Corn

Say that more concretely.



Herman

Dan Colussy, the man who eventually rescued Iridium out of bankruptcy, put it about as well as anyone has. He said the Iridium business plan was locked in place twelve years before the system became operational. Twelve years. You write a business plan in a world where nobody has a mobile phone, and you execute it in a world where everybody does.



Corn

That's the whole episode in one sentence.



Herman

It's most of it. But let's start with the aeroplanes, because they're the most expensive version of the mistake.



Corn

Concorde.



Herman

Concorde. Studies began in nineteen fifty-four. The Anglo-French treaty was signed on the twenty-ninth of November, nineteen sixty-two, with an original cost estimate of seventy million pounds. That's about one point seven seven billion in today's money.



Corn

And the final bill?



Herman

One and a half to two point one billion pounds by the time it entered service in nineteen seventy-six. Twelve to sixteen point seven billion in today's money. Roughly six times the original projection.



Corn

Six times. That's not an overrun, that's a different project wearing the first one's coat.



Herman

And here's the number that actually kills it. They forecast a market of three hundred and fifty aircraft. They built twenty.



Corn

Twenty.



Herman

Twenty airframes. And every airline except Air France and British Airways cancelled. Pan Am, TWA, United, Qantas, Lufthansa, Japan Airlines, all of them pulled out between nineteen seventy-two and nineteen seventy-five. Over a hundred options evaporated.



Corn

What did the engineers actually solve, though? Because this is the part I want on the record. These weren't incompetents.



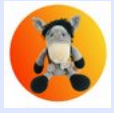
Herman

No, they were the best in the world. The ogival delta wing came out of Küchemann and Weber's work on slender-delta vortex lift. Analogue fly-by-wire, first on any airliner. Digital air-intake control units, which was the first full-authority digital control of an essential system on a passenger aircraft. They used the fuel as a heat sink to cool the airframe. The droop nose so the pilots could see the runway on approach.



Corn

And the airframe grew.



Herman

Three hundred millimetres in flight. Twelve inches, from kinetic heating. They had to cap the skin at a hundred and twenty-seven degrees Celsius, which is what set the speed limit at Mach two point oh two. Every one of those is a hard problem that had never been solved before.



Corn

And the thing that killed it was a fuel bill.



Herman

Fifteen point eight passenger-miles per gallon. The Boeing 747 got forty-six point four. The DC-10 got fifty-three point six.



Corn

So it was three times thirstier than a jumbo jet.



Herman

Three times thirstier than a jumbo jet, carrying a quarter of the passengers. Then the oil crisis hit in nineteen seventy-three, and wide-body jets were already scaling. Concorde was commercially irrelevant almost the moment it arrived. It flew until October two thousand three, but it was a museum piece with a schedule for most of that time.



Corn

And the Soviets built one too.



Herman

The Tu-144 is the more extreme case, and I think it's the purest version of Daniel's prompt in the whole episode. First flight on the thirty-first of December, nineteen sixty-eight. Two months before Concorde.



Corn

Deliberately.



Herman

Entirely deliberately. They flew it on the last possible day to hit a five-year-old government deadline. Brian Calvert, who was Concorde's flight manager, said the rush exacted a heavy penalty later, and he was being generous.



Corn

How bad was it?



Herman

Passenger service ran from the first of November, nineteen seventy-seven, to the first of June, nineteen seventy-eight. Fifty-five passenger flights. It was pulled after a crash-landing. In a hundred and two flights it logged over two hundred and twenty-six failures.



Corn

Two hundred and twenty-six failures in a hundred and two flights.



Herman

That's more than two per flight, yes. The designer, Alexander Poukhov, said in nineteen ninety-eight that the project was ten to fifteen years beyond the USSR's capabilities at that time. His own words. And Howard Moon, who wrote the book on the Soviet SST, called it an astounding achievement and a magnificent failure in the same breath, which I think is exactly right.



Corn

And then NASA bought one.



Herman

Spent three hundred and fifty million dollars converting it into a flying laboratory in the nineties. The Tu-144LL. So the machine that couldn't carry passengers ended up as a research aircraft for the people who'd beaten it.



Corn

There's something almost poetic about that. The loser gets a second career as a test rig.



Herman

It's the most dignified ending any of these things got.



Corn

Buran next.



Herman

Buran is where the numbers stop being abstract. The programme formally began in nineteen seventy-six as a direct response to the American shuttle. The cost came to seventeen point eight billion roubles in nineteen ninety figures. That's about seventy-four billion dollars in today's money. The largest and most expensive project in Soviet space history.



Corn

And how many times did it fly?



Herman

Once. The fifteenth of November, nineteen eighty-eight. Uncrewed. Fully automated flight and landing.



Corn

Which the American shuttle couldn't do.



Herman

Which the American shuttle could not do. That's the part people forget. The one time Buran flew, it did something the Shuttle programme never managed. It came back and landed itself, autonomously, in a crosswind, without a pilot aboard.



Corn

So it was more advanced in that one respect.



Herman

In that one respect, yes. And then it never flew again. It was destroyed in a hangar roof collapse on the twelfth of May, two thousand two. Killed eight workers. The programme itself was cancelled by Yeltsin on the thirtieth of June, nineteen ninety-three.



Corn

What was the actual problem?



Herman

Cost per launch, and no mission. Launching twenty tons on Energia-Buran cost an estimated two hundred and seventy million roubles. The same payload on a Proton rocket cost five and a half million.



Corn

That's a factor of...



Herman

Forty-nine.



Corn

Forty-nine times the price for the same job.



Herman

And the cosmonaut Oleg Kotov said it plainly. We had no civilian tasks for Buran and the military ones were no longer needed. That's the whole thing. They built the most sophisticated spacecraft in their history and there was nothing left for it to do.



Corn

There's a thread running through these three that I want to pull on.



Herman

Go ahead.



Corn

All three of them were partly political symbols. Concorde was Anglo-French prestige. The Tu-144 existed because Khrushchev wanted one. Buran existed because the Americans had a shuttle. These weren't built because a market demanded them. They were built because somebody needed to be seen building them.



Herman

And that's an accelerant and a trap at the same time. It gets you funding you'd never get commercially, and it locks you into a specification you can't walk away from when the world changes.



Corn

The Tu-144 is the cleanest example. They flew it on New Year's Eve because a deadline from five years earlier said they had to.



Herman

And it cost them. Every shortcut they took to hit that date came due later. You can't rush a supersonic airliner. The physics doesn't care about your five-year plan.



Corn

Those were all aerospace projects with national treasuries behind them.



Herman

Every one.



Corn

But the same pattern shows up in commercial technology. Where the money was private, the timeline was just as long, and the market moved just as fast.



Herman

Iridium. And I think Iridium might be the single best answer to what Daniel's asking, because it's the clearest case of something being obsolete before it launched.



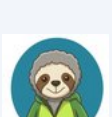
Corn

Tell it properly. It starts with a man on holiday.



Herman

It starts with Bary Bertiger, a Motorola engineer, in nineteen eighty-five. His wife was trying to reach clients from the Bahamas and couldn't. So he went home and designed a constellation of satellites so that nobody would ever be out of coverage again.



Corn

That's a very engineer response to a holiday inconvenience.



Herman

It is. And the idea was good. Seventy-seven satellites in low earth orbit, handing calls off between each other as they moved. Seventy-seven is the atomic number of iridium, which is where the name comes from. They ended up flying sixty-six active.



Corn

And the build rate?



Herman

Motorola was producing a satellite every four point three days at peak. That's a production line, not a workshop. They developed it on a fixed-price contract from July nineteen ninety-three, and service went live on the first of November, nineteen ninety-eight.



Corn

And the total?



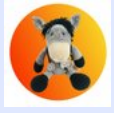
Herman

Over five billion dollars.



Corn

For a phone network.



Herman

And here's where the twelve years matter. The business plan was written when a mobile phone was a brick that rich people had in their cars. By the time the satellites were up, cellular coverage had gone from a luxury to something approaching a default. The thing Iridium was built to solve had been solved by something else, more cheaply, while they were still building.



Corn

What did the handset look like?



Herman

A pound in weight. Three thousand dollars. Calls at three to eight dollars a minute.



Corn

Three to eight dollars a minute.



Herman

And the coverage was extraordinary. You could call from the middle of the Pacific. There just weren't very many people in the middle of the Pacific who needed to.



Corn

So it filed.



Herman

Chapter eleven on the thirteenth of August, nineteen ninety-nine. One of the twenty largest bankruptcies in American history at the time. It had drawn fewer customers in ten months than the plan expected in the first year.



Corn

Ten months from launch to bankruptcy.



Herman

Ten months. And Colussy's line is the one that should be on the wall of every product manager's office. The business plan was locked in place twelve years before the system became operational.



Corn

Iridium was done in by cellular networks.



Herman

Yes.



Corn

The Cray-1 was done in by something even smaller. And the contrast is even more dramatic, because the Cray-1 wasn't beaten by a cheaper version of itself. It was beaten by a completely different idea of what a computer was.



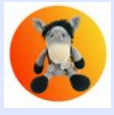
Herman

Seymour Cray spent four years designing it after he left Control Data. He'd been working on the CDC 8600 there and it had failed, so he walked out and started again.



Corn

What did he build?



Herman

Announced in nineteen seventy-five, first installed at Los Alamos in nineteen seventy-six. Seven point nine million dollars. About forty-two million in today's money.



Corn

For one computer.



Herman

Two hundred thousand gates. A C-shaped chassis, and the shape isn't aesthetic, it's electrical. He arranged the boards in a curve to shorten the wire lengths, because at that speed the wire is the delay. Twelve and a half nanosecond cycle time. Eighty megahertz. Cooled with Freon.



Corn

Liquid cooling in nineteen seventy-six.



Herman

Because air couldn't carry the heat away fast enough. And the thing that made it matter was the vector processor. First successful one. A hundred and sixty million floating point operations per second, several times faster than anything else on earth.



Corn

And it looked like a piece of furniture.



Herman

It looked like a curved bench with a loveseat in the middle. People used to sit on it for photographs. Seymour Cray reportedly got the idea for the shape from watching a football game.



Corn

Of course he did.



Herman

There's a story attached to the predecessor that I love. The CDC 6600, which Cray also designed, was the fastest computer in the world from nineteen sixty-four to nineteen sixty-nine. And Thomas Watson Junior at IBM wrote a memo on the twenty-eighth of August, nineteen sixty-three, saying, I fail to understand why we have lost our industry leadership position by letting someone else offer the world's most powerful computer.



Corn

And Cray's reply?



Herman

It seems like Mr. Watson has answered his own question.



Corn

That's the best line in the episode.



Herman

It's the best line in the history of computing, and I will not be taking questions.



Corn

So what killed the Cray?



Herman

The microprocessor. And the timing is almost cruel. The supercomputer industry crashed in the early nineties, because commodity chips got good enough and you could wire thousands of them together into a massively parallel cluster. You didn't need a bespoke vector machine anymore. You needed a lot of ordinary ones.



Corn

How far did the gap close?



Herman

By twenty thirteen, a typical smartphone processor was hitting about one gigaflop. That's roughly six times the Cray-1.



Corn

A phone in your pocket, six times the fastest computer on earth, thirty-seven years later.



Herman

And it cost a few hundred dollars instead of seven point nine million. The Cray-1 was the fastest machine of its kind for years. But its kind stopped being the kind that mattered.



Corn

The SS United States was the fastest ship of its kind, period. A record that still stands. And it was obsolete almost before it left the dock.



Herman

William Francis Gibbs designed it. Ordered in nineteen forty-nine, launched on the twenty-third of June, nineteen fifty-one, maiden voyage on the third of July, nineteen fifty-two. Cost seventy-one point eight million dollars. About six hundred and ninety-four million in today's money.



Corn

And the government paid for part of it.



Herman

They paid for what were called national defence features. The ship was designed so it could be requisitioned as a troop carrier at a moment's notice. That's why there's no wood anywhere aboard. It's a fireproof ship. Military-grade damage control throughout.



Corn

And the speed.



Herman

Two hundred and forty thousand shaft horsepower from four Westinghouse geared steam turbines. Thirty-eight point three two knots on trials. That is still the fastest Atlantic crossing ever made by a passenger ship. The Blue Riband was never contested. Nobody even tried.



Corn

She took it and retired the trophy.



Herman

Effectively, yes. They also fitted secret five-bladed inboard propellers, which is the kind of detail that only shows up when a navy is quietly involved in a passenger liner.



Corn

And then the jets came.



Herman

The first transatlantic jet passenger service was the fourth of October, nineteen fifty-eight. BOAC Comet. Six years after the SS United States entered service.



Corn

Six years.



Herman

Passenger numbers held up for a while, because flying was still expensive and uncomfortable and the ship was neither. But through the mid-sixties it collapsed. She was withdrawn in a surprise announcement on the fourteenth of November, nineteen sixty-nine. Seventeen years of service.



Corn

The finest ocean liner ever built, and it got seventeen years.



Herman

And the ending is strange. She's been sitting at a pier in Philadelphia for decades, and she's now being prepared to be sunk as the largest artificial reef in the world, off Destin, Florida.



Corn

The fastest ship ever built becomes a fish habitat.



Herman

It's not the ending Gibbs had in mind.



Corn

Give me the supporting cases before we pull this together, because Daniel asked for five and I want the shape of the thing clear.



Herman

Boeing 2707. The American supersonic transport. Kennedy launched the programme on the fifth of June, nineteen sixty-three. Boeing won the design competition on the first of January, nineteen sixty-seven. It was cancelled in nineteen seventy-one when the House voted two hundred and fifteen to two hundred and four to cut the funding. Both prototypes were still unfinished.



Corn

And the order book?



Herman

A hundred and fifteen unfilled orders from twenty-five airlines. All of them gone. The collapse cost Boeing over sixty thousand jobs. People called it the airplane that almost ate Seattle.



Corn

Sixty thousand jobs for an aircraft that never flew.



Herman

Never flew. Not one prototype. And then Saturn V. Thirteen launches between nineteen sixty-seven and nineteen seventy-three. Six point four billion dollars for the programme, about thirty-four and a half billion today. A hundred and eighty-five million per launch, which is roughly a billion in today's money.



Corn

The most powerful rocket ever flown.



Herman

And after Apollo it never flew again. The United States had no comparable heavy-lift capability for decades. They had to build a new one from scratch.



Corn

They threw away the tooling.



Herman

And the N1, the Soviet lunar booster. Four launches between nineteen sixty-nine and nineteen seventy-two, all four failed. Cost per launch, six hundred and four million in nineteen eighty-five dollars, which is about one point eight billion today. Cancelled in nineteen seventy-six.



Corn

Four launches, four failures, one point eight billion dollars a go.



Herman

The Soviet moon programme died with it.



Corn

So let's pull the pattern out, because there are three distinct mechanisms here and I don't think they get separated often enough.



Herman

Go.



Corn

First mechanism. The locked-in business plan. Iridium is the cleanest, twelve years from plan to operation. But Concorde did the same thing with its three hundred and fifty aircraft forecast. The Tu-144 did it with its twenty-aircraft plan. You commit to a market assumption at the start of a development cycle so long that the assumption cannot possibly survive it.



Herman

And the longer the cycle, the worse it gets. Aerospace is the worst offender because the cycles are measured in decades, not quarters.



Corn

Second mechanism. The cost-per-unit absurdity. Buran cost forty-nine times what a Proton did for the same payload. Concorde burned three times the fuel of a 747 for a quarter of the passengers. Being the most advanced machine can be economically fatal, because advanced usually means expensive, and expensive usually means you lose to the cheap thing that's good enough.



Herman

The displacing technology is almost never more sophisticated. That's the part people get wrong. The 747 is a much simpler aircraft than Concorde. A cellular network is much simpler than a satellite constellation. A microprocessor is much simpler than a vector supercomputer. Simpler, cheaper, and scalable is what wins.



Corn

Third mechanism. The summit just as the mountain moves. The Cray-1 and the SS United States both peaked at the exact moment a fundamentally different technology was scaling. Microprocessors. Jets. The engineers solved the hardest problems of the old paradigm precisely when the paradigm stopped mattering.



Herman

And that's the thing that makes it tragic rather than stupid. They weren't wrong about anything technical. Every problem they solved, they solved correctly. They just solved the wrong set of problems.



Corn

Because forecasting isn't an engineering problem.



Herman

No. And it doesn't yield to engineering methods. You can't test a market assumption the way you test a wing. You can't iterate on it in a wind tunnel.



Corn

There's one more angle on this that we haven't touched. The human scale of it.



Herman

The billions of dollars are almost too big to feel.



Corn

They are. Once you're past a certain number it stops meaning anything.



Herman

It's the same problem with all of them. You hear seventy-four billion dollars for Buran and your brain just files it as a big number. It doesn't land.



Corn

The individual engineer's eighteen months doesn't have that problem.



Herman

No. That lands.



Corn

I spent a while thinking about that this week. The people who wrote the specifications, the test procedures, the failure analysis. All that documentation for a machine that never got built.



Herman

It went somewhere.



Corn

It went into a drawer, mostly.



Herman

I think the money is the least interesting part of this.



Corn

So do I. The money's gone either way. What's interesting is the knowledge.



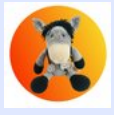
Herman

Whether it transfers.



Corn

Because if the next paradigm doesn't need it, it just sits there. Correct, careful, useless.



Herman

I don't know how you'd even measure that.



Corn

You can't. That's why nobody talks about it.



Herman

The documentation is the part that has no champion. Nobody writes a retrospective about the test procedures for an aircraft that never flew.



Corn

Right. The books get written about the money and the politics. The specifications go in a box.



Herman

And then one day somebody's clearing out a garage.



Corn

There's a delivery coming that needs a signature and the window closes in about ten minutes.



Herman

Sorry?



Corn

It's fine. Go on.



Herman

That was Hilbert.



Corn

I know.



Herman

He's gone.



Corn

He'll be back. He's always back.



Herman

He still has the drawings. And the museum didn't want them.



Corn

Because the machine was never built.



Herman

So the documentation of the finest version of a technology that never flew is sitting in a box in a garage, and the only reason we know it exists is that he mentioned it on his way out the door.



Corn

There's something in that. The archive of the thing that didn't happen.



Herman

Every one of these cases has one. Somewhere there's a filing cabinet with the complete engineering record of a machine that lost.



Corn

And no historian will ever open it, because the interesting story is the one that flew.



Herman

The interesting story is the one that flew. The box is the story of the one that didn't.



Corn

Which brings me to the thing I keep circling.



Herman

Go on.



Corn

Is this pattern accelerating or slowing down?



Herman

That's the right question and I don't know the answer.



Corn

Because the development cycles have compressed enormously. Iridium took twelve years from plan to operation. Software takes twelve weeks.



Herman

Which could cut either way. Faster iteration means you find out sooner that you're building the wrong thing. It also means you can commit to a wrong assumption and execute it completely before anyone notices.



Corn

So are we building more Iridiums or fewer?



Herman

My instinct is more, but the failure is quieter. A five billion dollar satellite constellation going bankrupt is a newspaper story. A company burning two years and forty million dollars on the wrong architecture is a footnote.



Corn

And the footnote version doesn't get a Smithsonian retrospective.



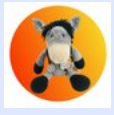
Herman

Which means we only see the pattern when it's expensive enough to be visible. The cheap versions happen constantly and nobody counts them.



Corn

The uncomfortable implication here is that the engineers weren't wrong.



Herman

They weren't. Not once. Concorde's wing was a masterpiece. Buran's automated landing was a genuine first. The Cray-1 was the fastest machine on earth. The SS United States still holds the record.



Corn

The failure was in the forecasting, not the engineering.



Herman

And forecasting is not an engineering problem. That's the sentence I'd put on the wall next to Colussy's.



Corn

So the next time you see a machine that represents the absolute summit of its paradigm, the question isn't how good it is. It's what mountain everybody else is climbing.



Herman

And whether they're already most of the way up it.



Corn

If you enjoyed this episode, please leave a review. It helps other listeners find the show.



Herman

It does. And it's the cheapest thing you can do for us.



Corn

Thanks as always to our producer, Hilbert Flumingtop, who is currently signing for a delivery.



Herman

He'll be back.



Corn

He's always back. This has been My Weird Prompts.



Herman

The human-AI collaboration podcast. We'll be back soon.