

Design at F1 Speed

David France, IT Director



Who we are

- Member of the exclusive formula one “club”
 - A global shop window
- Highly competitive environment
 - Performance improvements are measured in terms of 1,000ths of a second
- Technology reliant
 - Pushing technology for competitive advantage (materials, ICT, etc.)
 - But not “bleeding” edge
- Secretive and security conscious

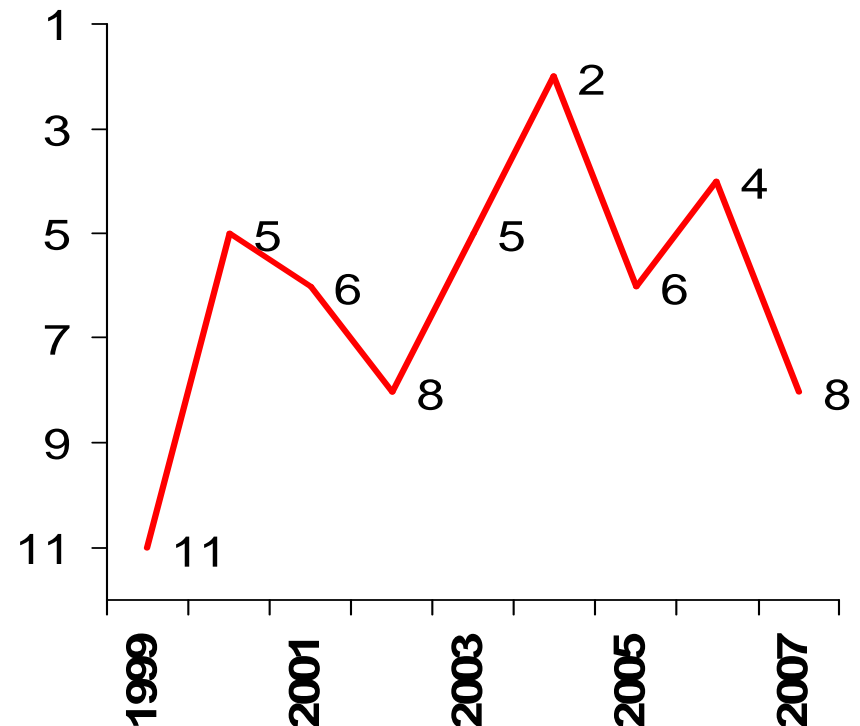


A brief history of the team

notable facts

- Founded in 1997 (acquired the Tyrell Racing team)
- British American Tobacco, Craig Pollock and Adrian Reynard
- Honda became joint shareholder with BAT in December 2004
- Honda became sole owner in December 2005
- The Power of Dreams

championship positions



“Since childhood, my dream was to become a champion in World automobile racing with a machine I had made myself”

“If there is no racing, there is no Honda.”

Soichiro Honda
1906-1991



- Honda dominated Formula One in the 1980s supplying engines to the Williams & McLaren teams
 - 5 drivers championships
 - 6 constructors championships
- Our dream is to achieve that level of success again

The Honda Racing F1 Team

- Operate from
 - 1 location in the UK (Brackley)
 - Race tracks around the world
- We have
 - Over 650 staff
 - Plus 50 Honda engineers
 - Over 100 people travel regularly
- A light engineering business
 - With a “mobile” front office
- Everyone is passionate about motor racing!



At the team operations centre

- High tech. purpose-built factory
 - Sophisticated engineering manufacturing plant
 - 2 wind tunnels
- Information Technology infrastructure to support
 - The end to end process
 - Multiple buildings
- Mixture of business systems
 - Common applications e.g. CAD, CAM, ERP, etc
 - Specialist applications e.g. CFD, FEA, etc



The IT team

- Our aim is to provide the information and communication technology services to enable Honda Racing F1 Team to win the FIA World Championship
 - a “virtual team”
 - 20 staff
 - 2 assigned to Racing & Testing
- working with**
- trusted partners & suppliers



Official Team IT Partners



converged communications



data storage & back-up solutions



audio visual systems



web-site hosting services



pit lane laser communication



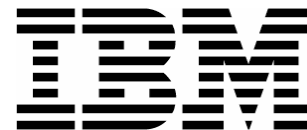
SAP development & support



voice communications



data communications



CAD, CAM & PDM

Some facts about the Honda RA107

- We build 7 or 8 chassis pa for testing & racing
- More than 80% of the car is designed & built in-house
- 30,000 aero parts drawn pa
- 20,000 car parts drawn pa
 - Including revisions
- 10,000 components in the race car BoM
 - 3,500 drawn by Honda
- Manufacture over 250,000 components each year
- Relentless drive to develop & improve the car



To be a successful formula 1 team...

- You must be able to design, build, test and race a car... ***that has the right balance between speed, reliability and safety***

and

- be able to develop and improve the performance of the car during the race season... ***at a faster pace than the competition***



The Competitive Environment

- A contest between
 - FIA regulators – trying to slow the cars down
 - F1 engineers – trying to make the cars go faster
- Technical regulations
 - Extensive & voluminous
 - But open to interpretation in many areas
 - Major changes every 2-3 years
- Exploiting the “grey areas” is one way of gaining a competitive advantage



How to improve the car

- Espionage
 - Not recommended
- Replication
 - Observation
 - “Similar” developments
- Evolution
 - Rapid, continuous development
- Revolution
 - Innovation



Innovation in F1

- F1 engineering maturity
- Main focus: use of materials
 - Different materials
 - Different construction
 - Energy absorbing structures
- F1 technology finds its way into road cars
 - Traction Control
 - ABS
 - Gearbox
- Future?
 - Aerodynamic focus
 - Kinetic Energy Recovery Systems

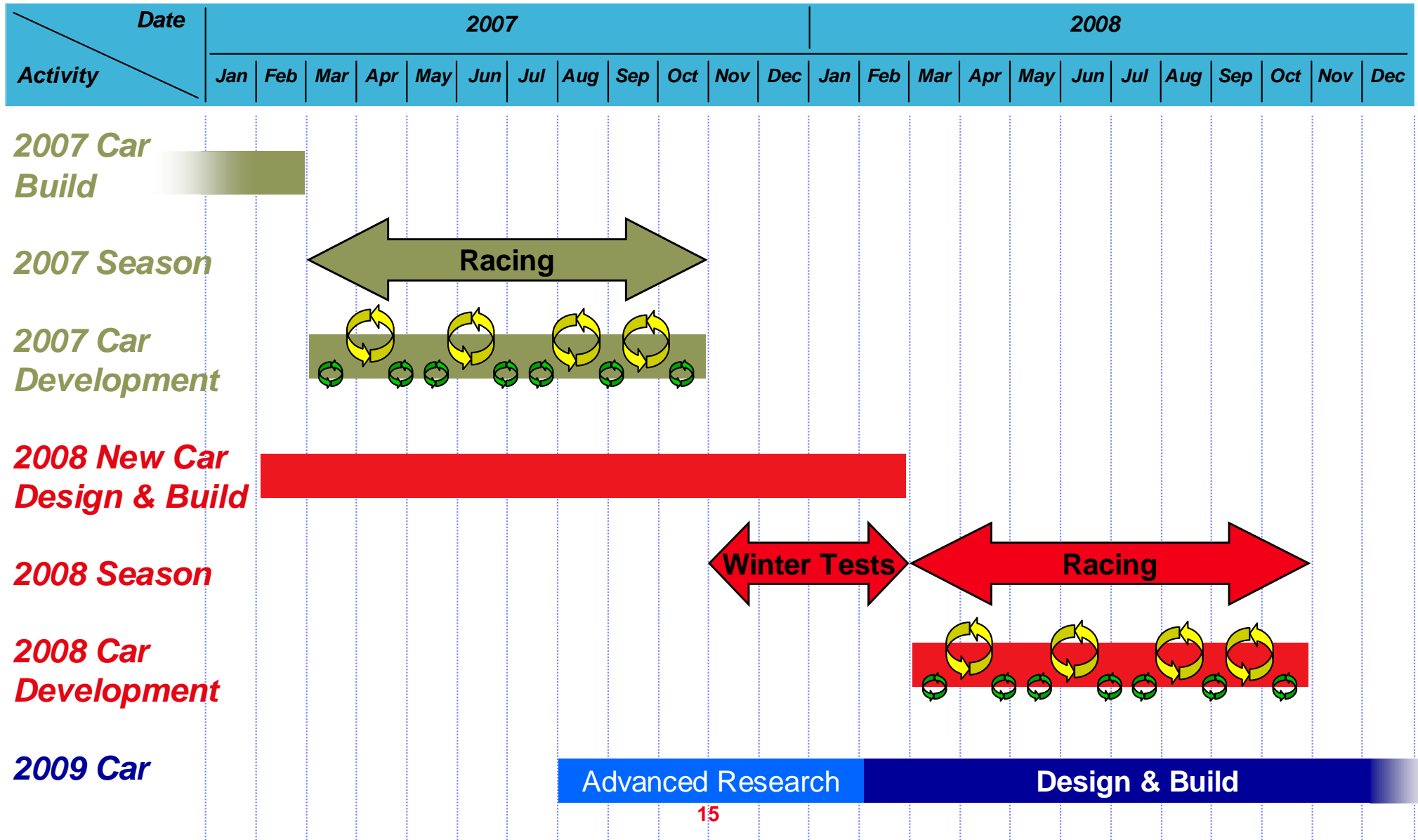


Design dependant competitiveness

- Continuous car development is critical to competitiveness
- F1 is one of the most competitive environments
 - Fractions of a second make a difference to race grid position
- Teams that do not develop their cars will become less competitive
- Teams that are trying to improve competitiveness have to do so at a faster rate than others to catch up



Outline Scheduling

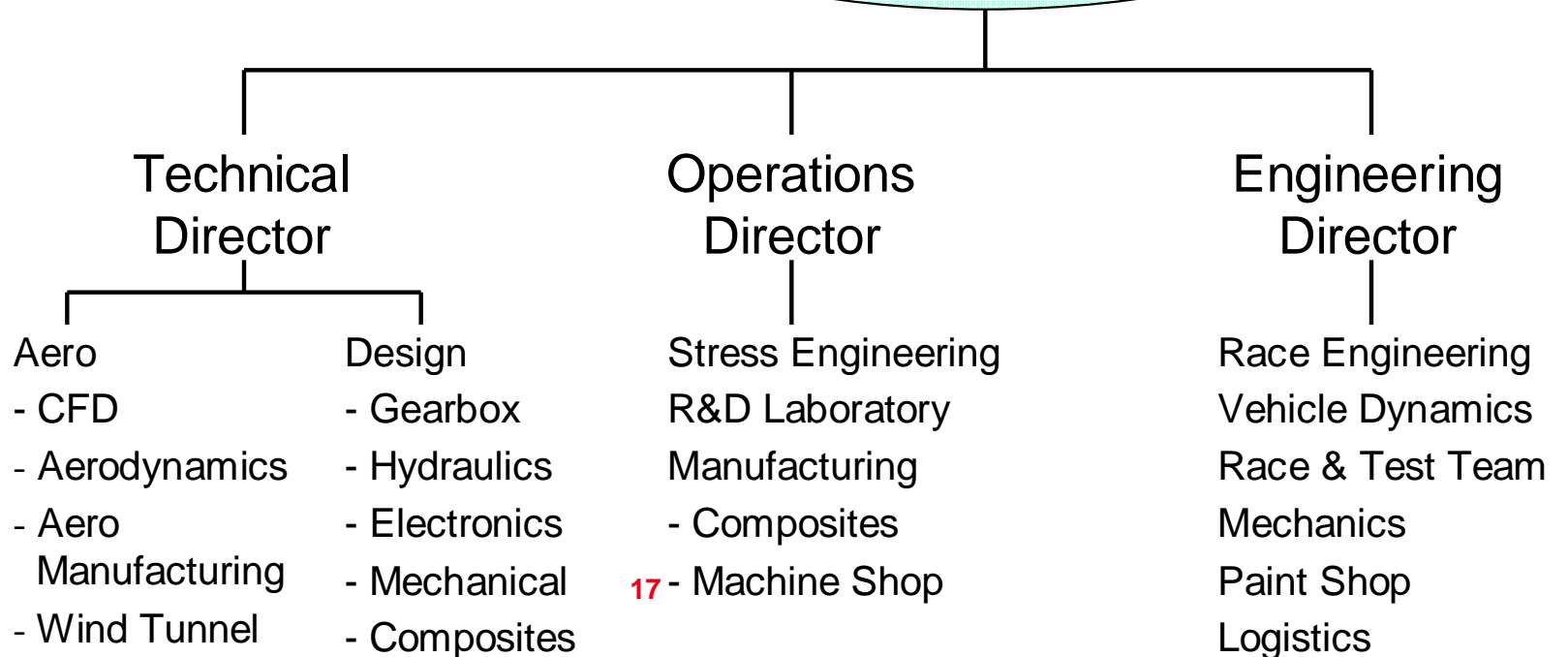
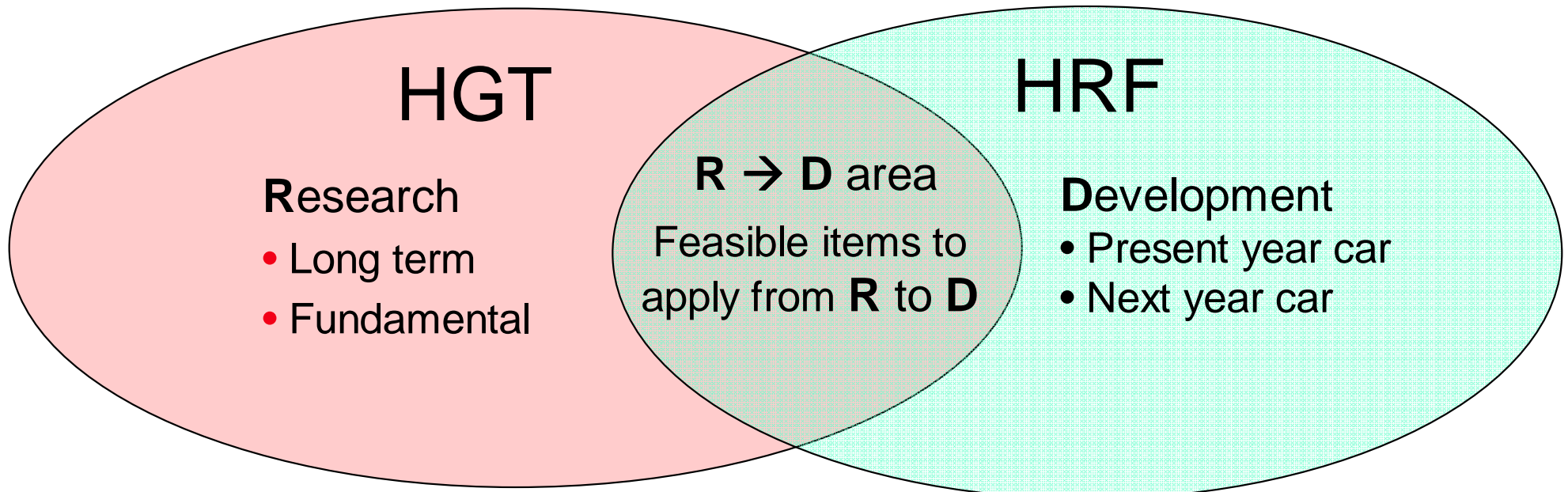




2007 Race & Test Schedule

	M	T	W	Th	F	Sa	Su	M	T	W	Th	F	Sa	Su	M	T	W	Th	F	Sa	Su	M	T	W	Th	F	Sa	Su	M	T									
JAN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	JAN							
FEB	wk 1							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	FEB
MAR	wk 2							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	MAR
APR	wk 3							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	APR
MAY	wk 4							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	MAY
JUNE	wk 5							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	JUNE
JULY	wk 6							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	JULY
AUG	wk 7							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	AUG
SEPT	wk 8							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	SEPT
OCT	wk 9							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	OCT
NOV	wk 10							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	NOV
DEC	wk 11							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	DEC
	M	T	W	Th	F	Sa	Su	M	T	W	Th	F	Sa	Su	M	T	W	Th	F	Sa	Su	M	T	W	Th	F	Sa	Su	M	T									

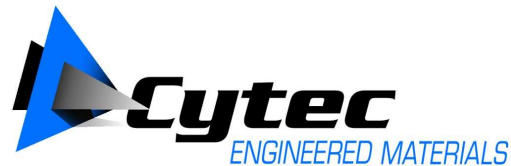
Organisation



Development with Technical Partners



- Development of high performance braking systems



- Development of composite / carbon fibre materials



- Developing new ways of testing materials e.g. trace element testing



- Developing improved methods of tyre temperature testing for vehicle dynamics

End to end process flow

- Research →
Concepts →
Evaluate



End to end process flow

- Research →
Concepts →
Evaluate →
CFD →
Aero Design →
Manufacture Model →
Wind Tunnel Test →
Evaluate



End to end process flow

- Research →
- Concepts →
- Evaluate →
- CFD →
- Aero Design →
- Manufacture Model →
- Wind Tunnel Test →
- Evaluate →
- Design →
- Manufacture →
- Track Test →
- Evaluate/Approve →
- Race



IT to support rapid car development

- CFD systems that
 - Enable fast analysis of models
- FEA systems that
 - Stress analysis of component designs / concepts
- CAD systems that
 - Supports rapid iterations in part design
- PDM systems that
 - Manages multiple part versions
- Processes
 - Simple & efficient
 - Good usability / ease of use



Culture to facilitate the process

- No blame culture
 - Fear of failure can limit willingness to experiment
 - Risk taking is allowed
- Learning environment
 - Plan → Do → Review
 - Sharing information
- Competitiveness
- But you need to know ...
 - When to stop pursuing unproductive lines of development
 - When to revisit previously discarded concepts



Summary:

“The ability to innovate and change is a prerequisite to success”



Some Soichiro Honda Quotes

1906-1991

- "Success is 99% failure. I've failed 99% of my trials, in order to succeed in the remaining 1%."
- "I've never refused competitors' visits to our factory. I've welcomed them at any time. Because I am willing to jump to new innovations when they try to follow us."
- "Honda has been choosing the hardest way, pursuing original technologies. I believe technologies borrowed from others will never become our flesh and blood".
- When the Emperor asked about innovation, "It is like falling in love. If you think it's distressing, it is unbearably distressing. If you think it is joyful, it is of supreme joy".





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