

Using Technology Effectively

McLaren
APPLIED TECHNOLOGIES

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World Rowing Coaches Conference
22nd January 2011

F1

AN INTRODUCTION

McLaren APPLIED TECHNOLOGIES

AN INTRODUCTION

“To realise breakthroughs in **performance** through the application of McLaren **technology** and design”



SPORTS

- PERFORMANCE OPTIMISATION
- STRATEGY & SIMULATION
- SMART TECHNOLOGY
- HIGH PERFORMANCE EQUIPMENT



HEALTH & WELLNESS

- TELEHEALTH SYSTEMS
- PHARMACEUTICAL SERVICES
- HUMAN PERFORMANCE
- MEDICAL GRADE TELEMETRY
- REAL TIME, REMOTE DATA COLLECTION



LOGISTICS

- VISUALISATION
- STRATEGY
- SIMULATION
- SMART TELEMETRY
- ENERGY
- TRANSPORT
- ENTERTAINMENT



TECHNOLOGY AND DATA UNDERPINS
EVERYTHING
WE DO

06

IF YOU CAN
MEASURE 500
SIMULTANEOUS
DATA FEEDS
**WHY WOULD
YOU SETTLE
FOR JUST ONE?**





500 SENSORS PER CAR

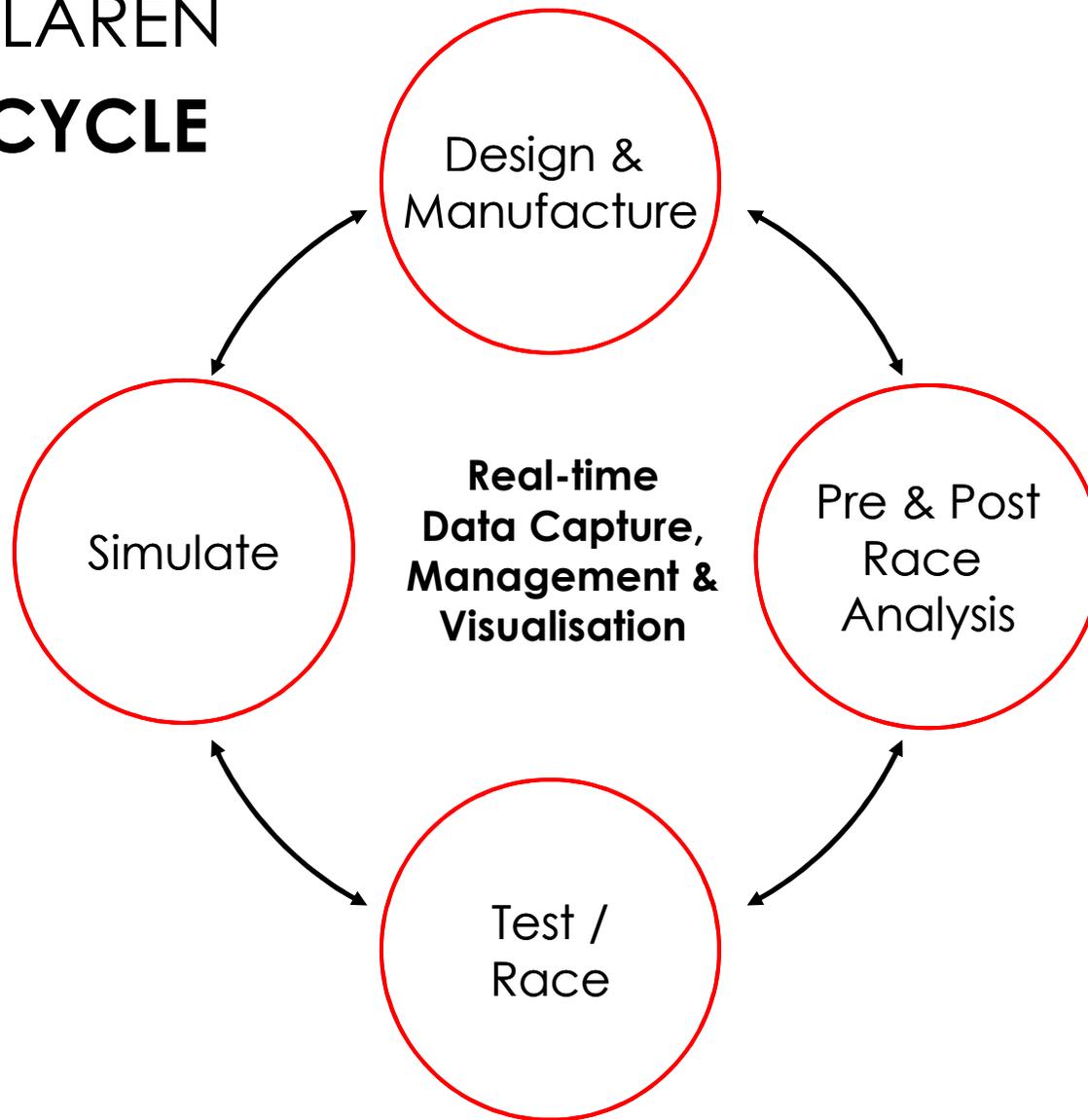
Creating over 1100 channels at up to 1000Hz

1,400,000,000 DATA POINTS IN RACE

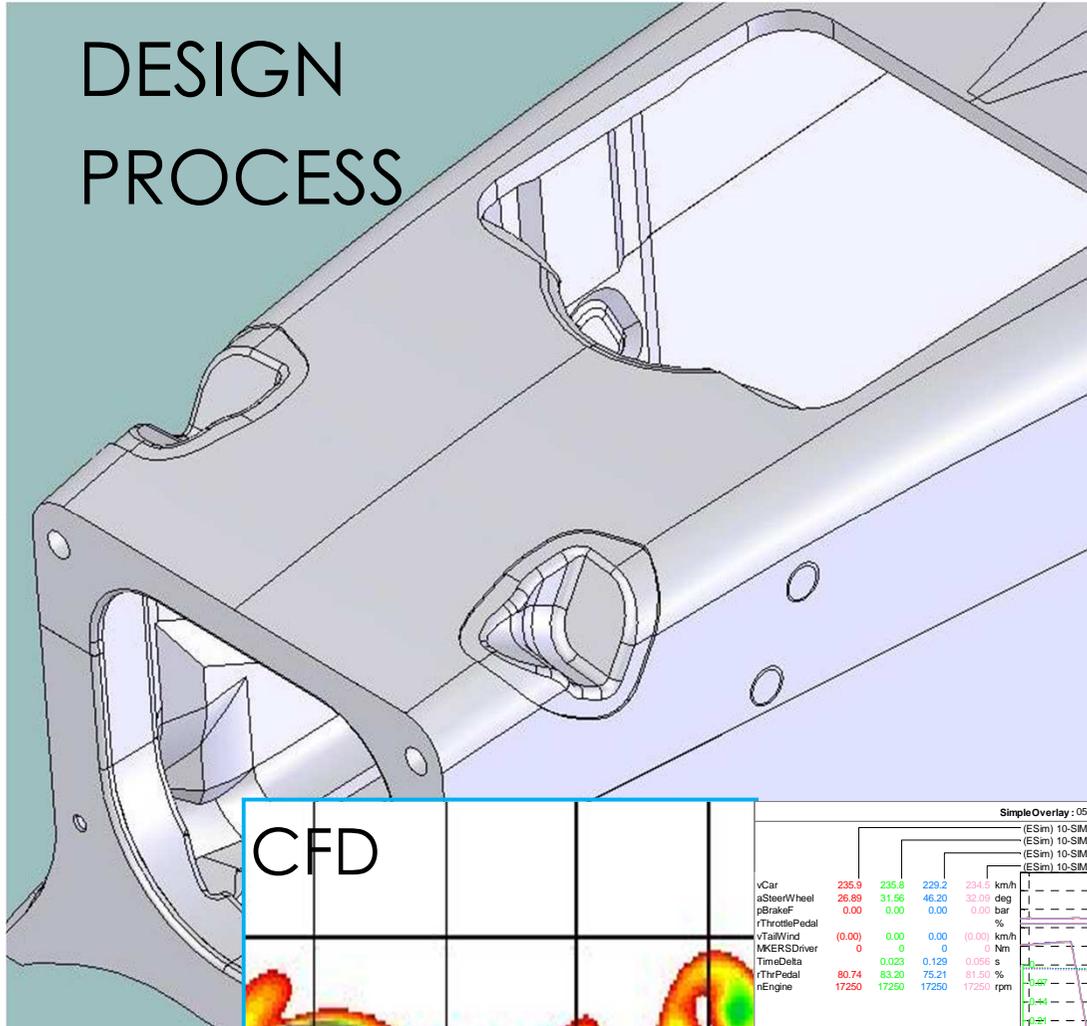
10GB of time-series data over a
race weekend

...IN REAL TIME

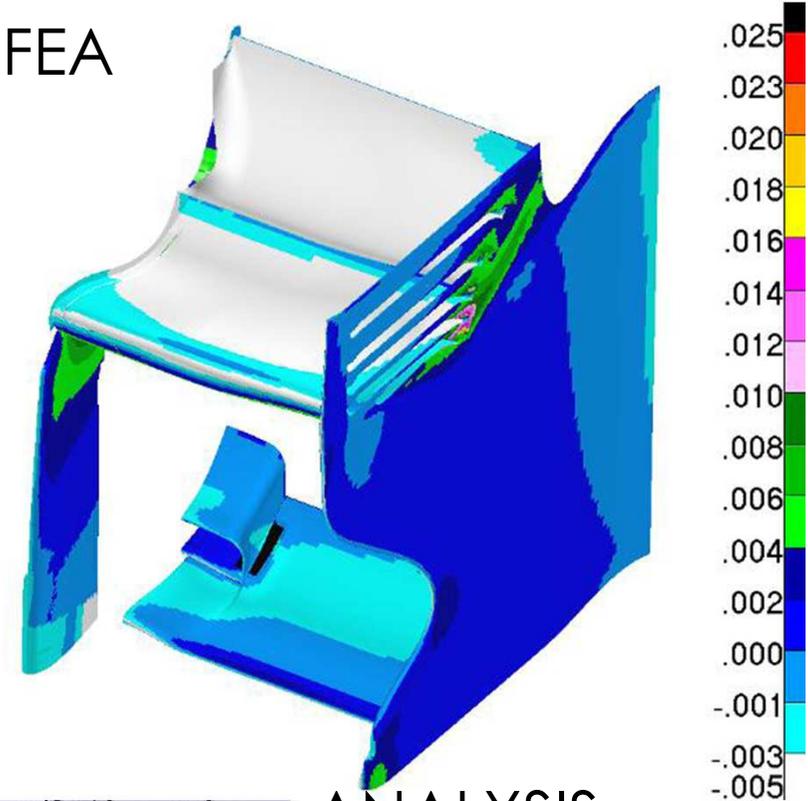
McLAREN F1 CYCLE



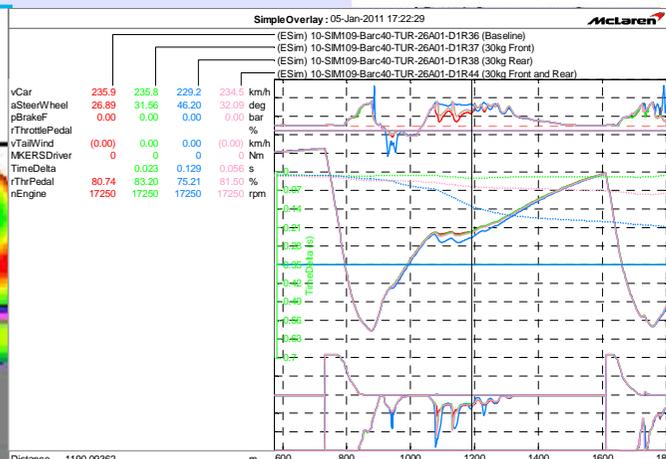
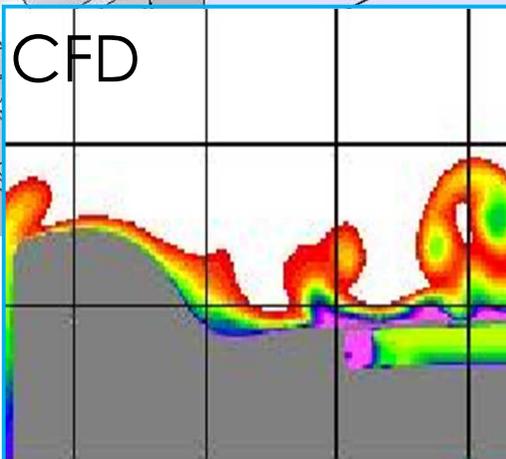
DESIGN PROCESS



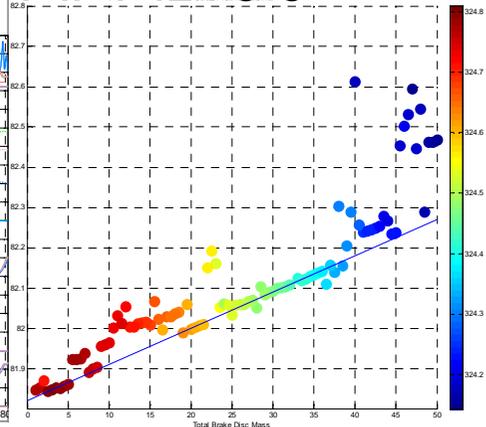
FEA



CFD



ANALYSIS



WIND
TUNNEL



RACE



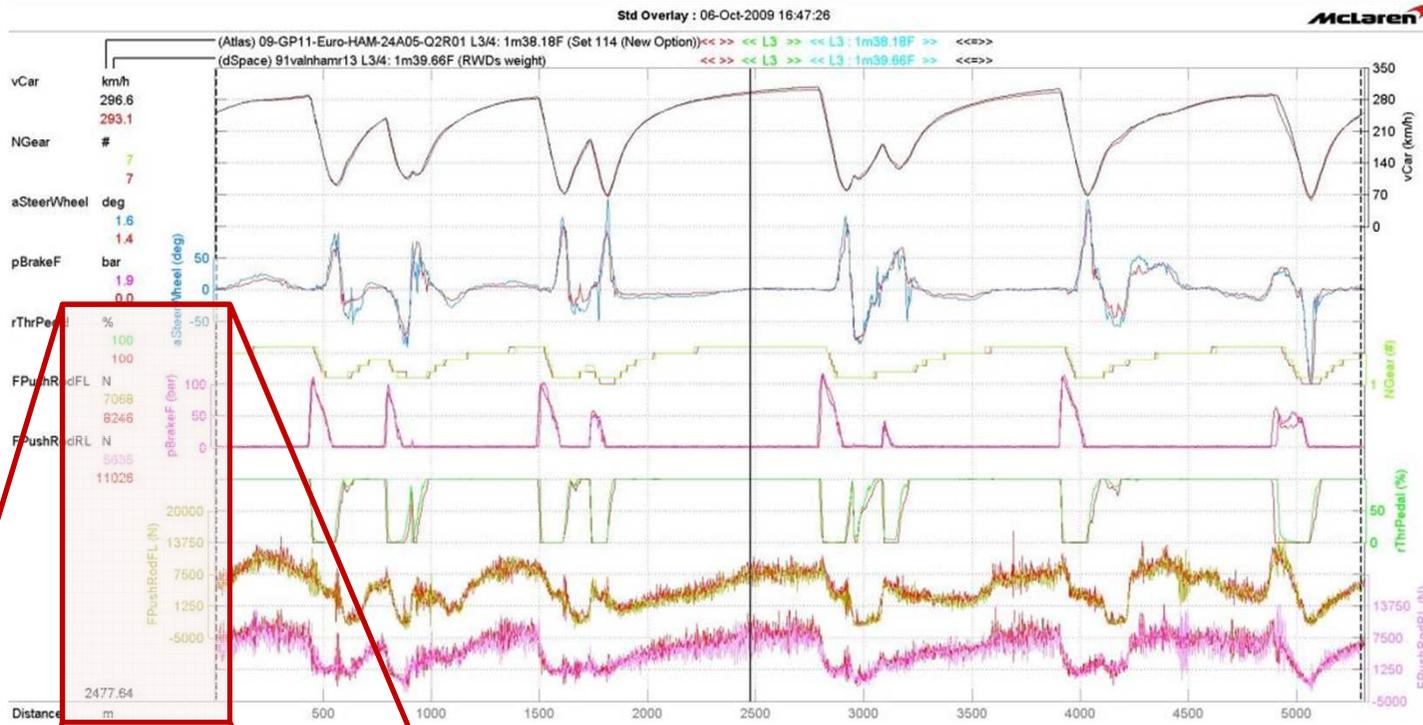
RACE SIMULATION



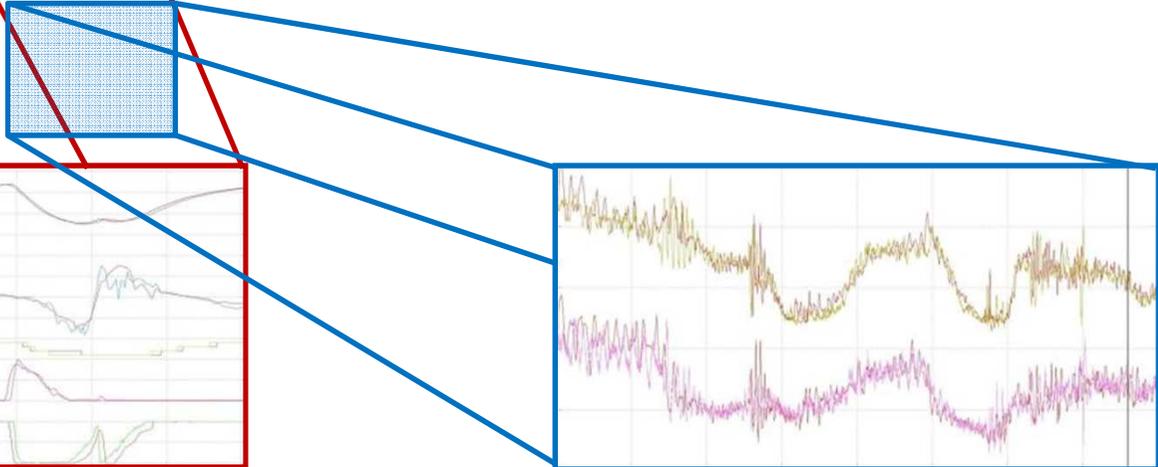
SIMULATION



CAR DEVELOPMENT
DRIVER TRAINING
RACE ENGINEER TRAINING



Driver controls



Model validation

RACE STRATEGY OFFLINE DRIVER TRAINING TOOLS

The screenshot displays a comprehensive race strategy and driver training interface. At the top, a table lists driver performance metrics across various sectors and laps. Below this, a track map shows the current lap status and timing. The bottom section features a multi-view driver training simulator, including a top-down view of the car's position on the track, a rear-view perspective, and a front-view perspective. The simulator displays real-time data such as speed (75 kph, 78 kph, 73 kph) and lap times (11,253, 11,550, 10,969). The interface also includes a 'Car Status' section with buttons for MCL HAM, MBE HAM, MBM HAM, and ECU HAM.

Driver	Team	GAP	INT	WEB	KOB	WEB	ALO	HAM	BUT	1:35.359	HAM
1	WEB	Red Bull	LAP	13	26.579	292					
3	4	ROS	Mercedes	20.7	17.7	27.011	294	31.308	282	38.182	280
4	11	KOB	Renault	23.9	3.2	27.066	290	31.545	277		
6	14	SUT	F India	29.5	4.5	27.205	298	31.614	276	38.143	284
7	12	PET	Renault	32.4	2.8	27.391	293	31.571	279	38.333	278
8	10	HNL	Williams	34.1	1.8	27.333	289	31.578	279	38.696	277
9	16	BUE	STR	34.5	0.4	27.173	299	31.511	274		
10	16	BUE	STR	36.8	1.5	27.517	293	31.511			
11	17	ALG	STR	37.8	1.8	27.492	291	31.937	277	38.278	281
12	8	ALO	Ferrari	24.8	10.3	43.649	292	31.034	286		
13	9	BAR	Williams	27.2	2.4	44.585	291	31.539	277		
14	23	KOB	Sauber	29.5	2.4	45.147	290	31.594	276		
15	3	MSC	Mercedes	47.1	17.6	28.022	297	31.727	282	1:56.176	
16	15	LIU	F India	49.8	2.7	27.721	294	32.034	274	1:38.768	
17	18	TRU	Lotus	53.3	3.5	28.126	286	32.517	278	1:39.765	
18	19	KOV	Lotus	54.1	8.8	28.048	289	32.711	271	1:40.076	
19	24	GLO	Virgin	56.4	2.4	28.291	289	32.592	280	1:36.428	
20	7	MAS	Ferrari	58.4	2.8	26.972	294	32.111	279	1:41.781	
21	20	CHD	HRT	73.8	15.4	28.777	291	33.141	268	1:42.417	
22	21	YAM	HRT	81.4	7.6	28.772	289			1:36.524	
23	5	VET	Red Bull	88.1	8.8	27.227	292			1:36.524	
24	5	VET	Red Bull	88.1	8.8	27.227	292			1:36.524	
25	DNF	Virgin	4 L	3 L	38.225	277	35.437	210			

HUMAN HIGH PERFORMANCE



HUMAN HIGH PERFORMANCE

Health &
Fitness

Mental
Energy

Skill
Acquisition

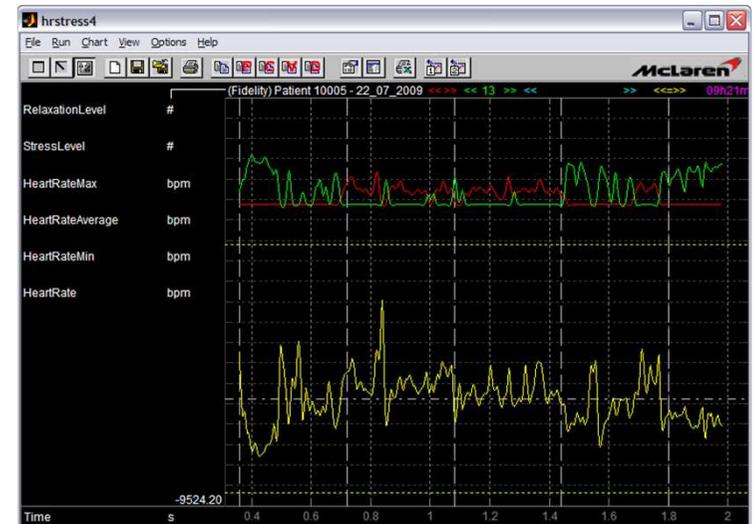
HUMAN HIGH PERFORMANCE

Health &
Fitness

Mental
Energy

Skill
Acquisition

Collect general health &
wellbeing data
Nutrition questionnaires
HRV monitoring and
questionnaires for recovery



HUMAN HIGH PERFORMANCE

Health &
Fitness

Mental
Energy

Skill
Acquisition

Mood questionnaires

Correlation with
performance



HUMAN HIGH PERFORMANCE

Health &
Fitness

Mental
Energy

Skill
Acquisition



Simulator
Analysis tools
Race performance
analysis
Pit-stop practices
Video analysis

GOING **BEYOND** F1

RESTRICTED ACCESS

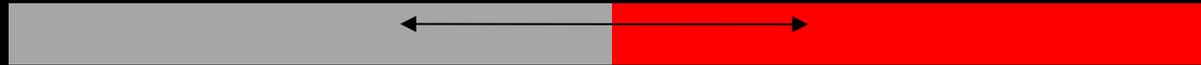
OPTIMAL
EQUIPMENT
PERFORMANCE

OPTIMAL
HUMAN
PERFORMANCE

100%
Machine

50:50

100%
Human



Balance varies with Application & Sport – same principles apply



SPORTS

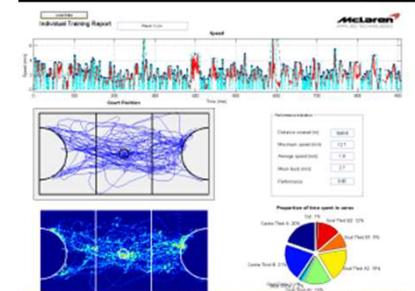
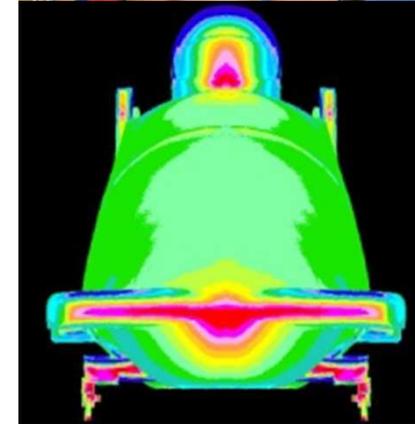
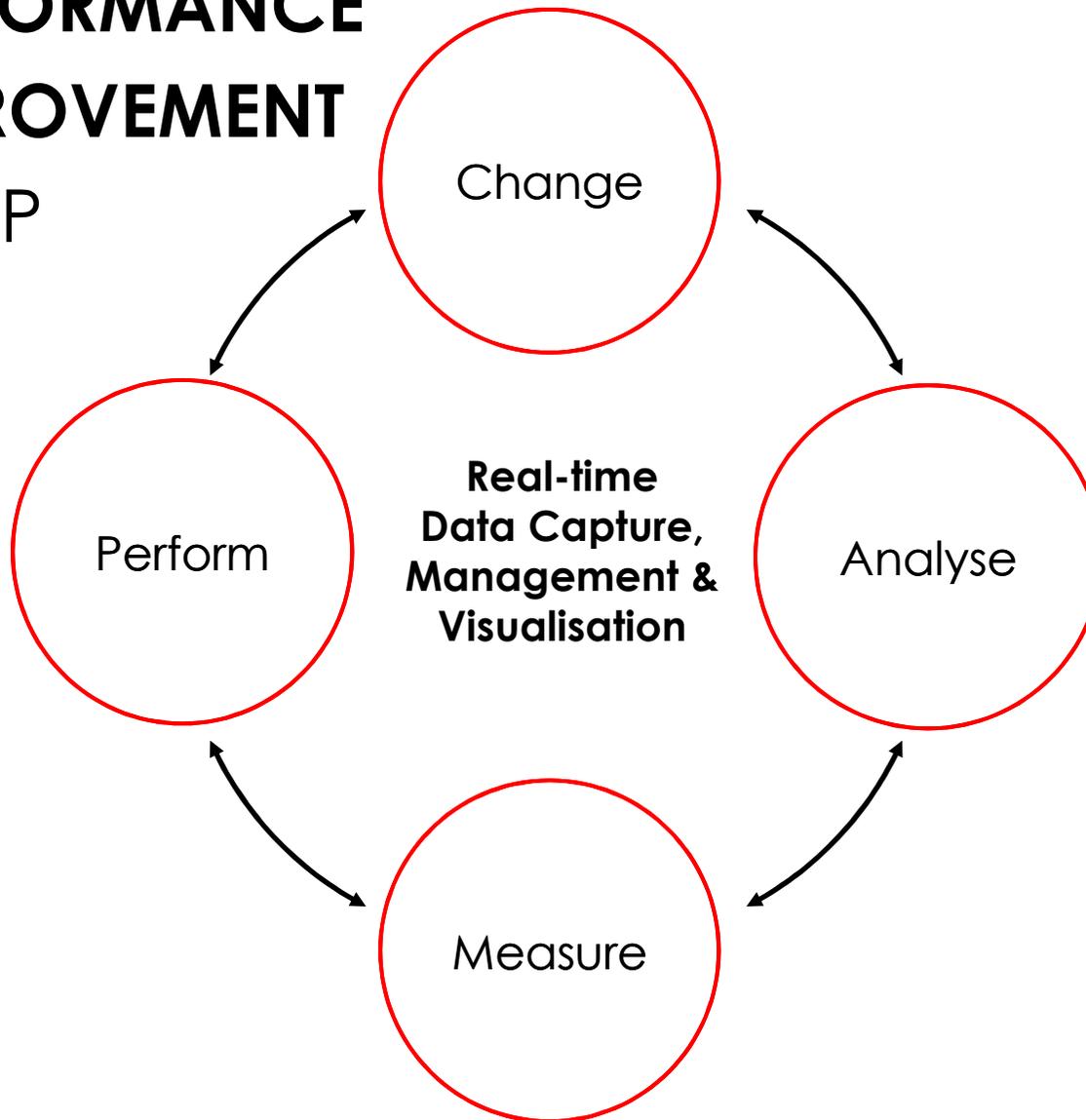
PERFORMANCE OPTIMISATION

STRATEGY & SIMULATION

SMART TECHNOLOGY

HIGH PERFORMANCE EQUIPMENT

PERFORMANCE IMPROVEMENT LOOP



CRITICAL SUCCESS FACTORS

MAKING CHANGES

In Game tactical Changes

In Training

Defining areas for improvement

Setting & Measuring

Progress towards goals

Preventing Injuries

DATA COLLECTION

Un-obtrusive

Convenient

VISUALISATION

Simplified & customisable

Real-time + post-event

DERIVATION/DISTILLATION

Innovative/Customisable

Real-time + post-event



HEALTH & WELLNESS

TELEHEALTH SYSTEMS

PHARMACEUTICAL SERVICES

HUMAN PERFORMANCE

MEDICAL GRADE TELEMETRY

REAL TIME, REMOTE DATA COLLECTION



LOGISTICS

VISUALISATION
STRATEGY
SIMULATION
SMART TELEMETRY
ENERGY
TRANSPORT
ENTERTAINMENT

SUMMARY

Technology and **Data** underpin everything we do
Optimal **Equipment** Performance
Optimal **Human** Performance

