

**ACCU
2021**
VIRTUAL EVENT

Bloomberg
Engineering

undo



How Technical Debt Can Kill Your Business. How F1 Teams Crack Technical Debt.

Luca Minudel

HOW TECHNICAL DEBT CAN KILL YOUR BUSINESS

HOW F1 TEAMS CRACK TECHNICAL DEBT



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SmHarter.com/Blog



LUCA MINUDEL

 @LUKADOTNET

AGILE PRACTITIONER SINCE 2001-2002

COMPLEXITY PRACTITIONER SINCE 2004

LEAN PRACTITIONER SINCE 2006

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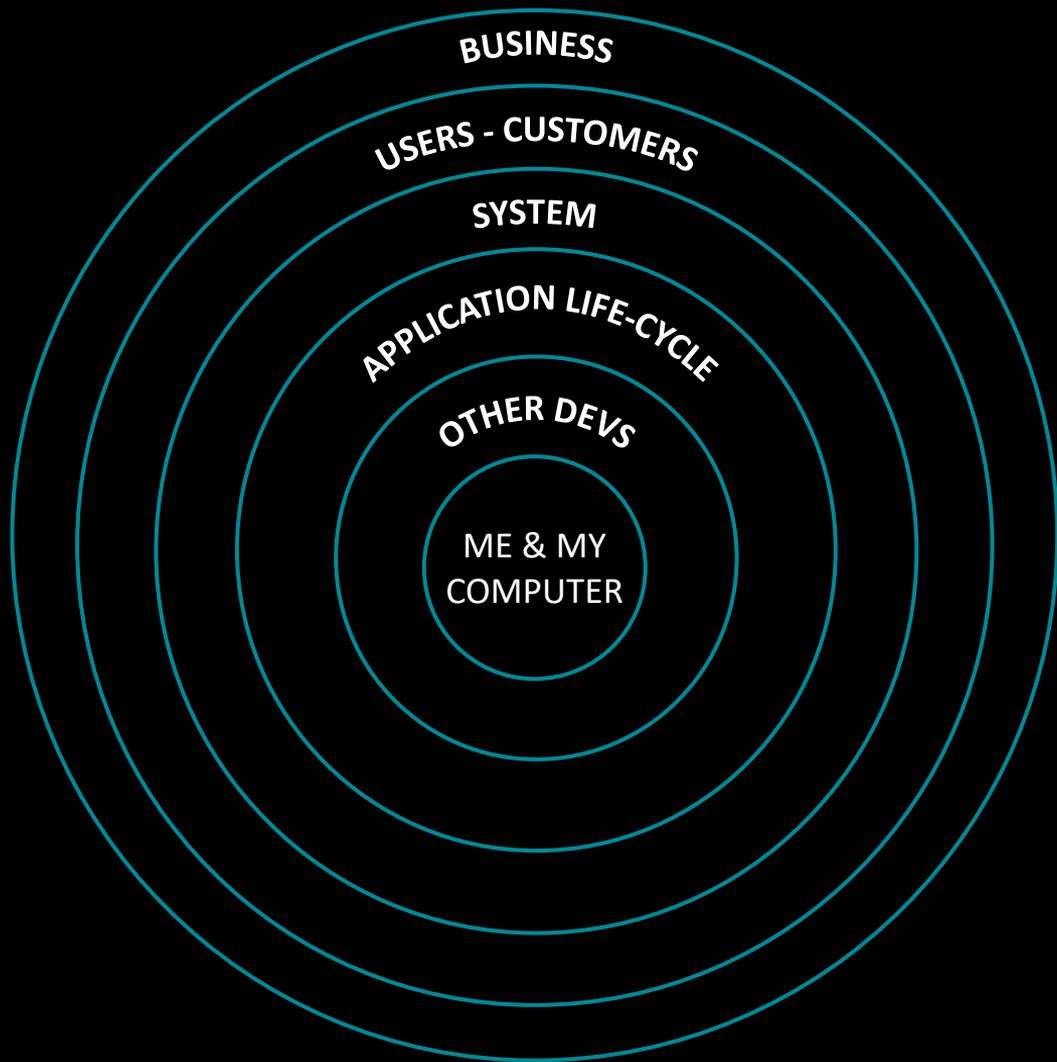
ThoughtWorks®

HSBC 

 LexisNexis®

LLOYDS
BANKING
GROUP 

MY PERCEPTION OF TECH EXCELLENCE EXPANDING OVER TIME



SKILLS/QUALITY DEBT (A MESS):

CAUSED BY POOR INADVERTENT TECHNICAL DECISIONS LEADING TO LOW-QUALITY CODE, DESIGN, FEATURES, ETC.

TECHNICAL DEBT:

INTENDED AS DELIBERATELY TAKING SHORT CUTS IN ORDER TO EXPEDITE A RELEASE.

AS A CONSEQUENCE OF IT THE DEVELOPMENT TEAM INCURS IN LOSS OF PRODUCTIVITY, UNTIL THOSE SHORT CUTS ARE TAKEN CARE OF WITH REFACTORING.

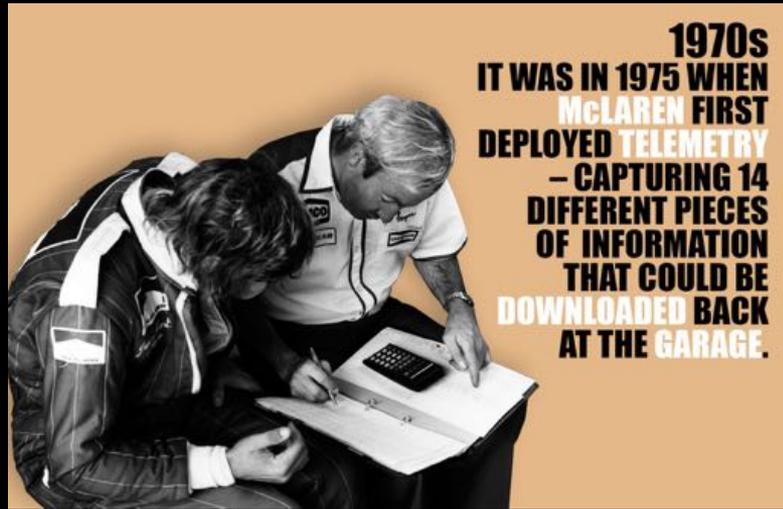
WHEN IT MAKES BUSINESS SENSE TO DO SO,
THIS IS WHERE BUSINESS STRATEGY MEETS ENGINEERING STRATEGY.

HOW TECHNICAL DEBT CAN KILL YOUR BUSINESS...

HOW F1 TEAMS CRACK TECHNICAL DEBT...

F1 TEAMS FACE

- HUGE PRESSURE TO CONSTANTLY DELIVER+LEARN**
- FREQUENT & UNESCAPABLE REALITY CHECKS**
- FAILURE AND SUCCESS OUT IN THE OPEN**



1970s
IT WAS IN 1975 WHEN
MCLAREN FIRST
DEPLOYED TELEMETRY
– CAPTURING 14
DIFFERENT PIECES
OF INFORMATION
THAT COULD BE
DOWNLOADED BACK
AT THE GARAGE.



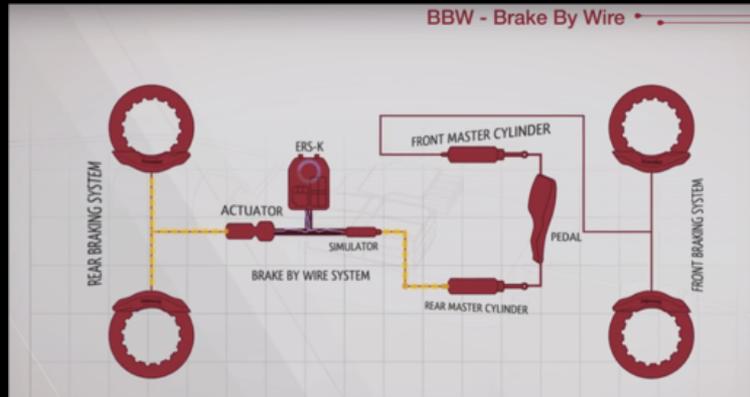
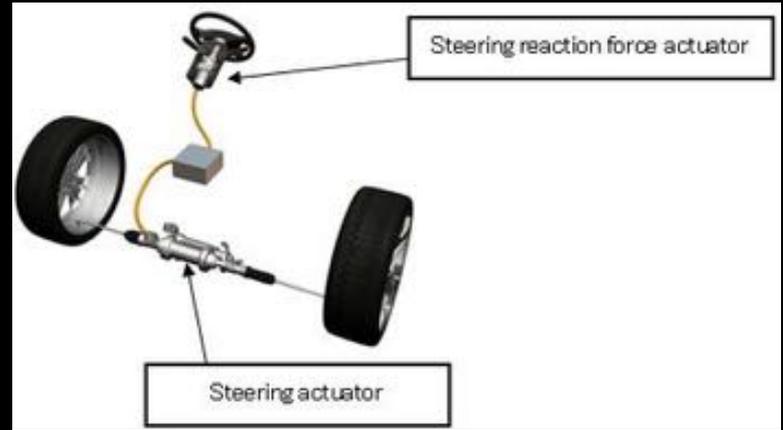
1980s
THE INTRODUCTION OF ELECTRONIC ENGINE
MANAGEMENT SYSTEMS ALLOWED
GREATER CONTROL OF
POWER, DRIVABILITY,
AND FUEL EFFICIENCY.

F1-IT 1970s–1990s



1990s
IT WAS THE '90s
THAT FINALLY SAW AN
EXPLOSION OF
COMPUTING
CAPABILITY – ON
THE CAR ITSELF,
BUT ALSO
THROUGHOUT
THE WHOLE
TEAM.

F1-IT 2016-2019



2001

WATTS S. HUMPHREY - PIONEER IN SW ENGINEERING,
FATHER OF SW QUALITY

Every Business is a Software Business



@giulio_vian

2011
MARC ANDREESSEN – ENTREPRENEUR, INVESTOR, SW ENGINEER

Software Is Eating The World



2017

GREGOR HOHPE - TECH DIRECTOR GOOGLE CLOUD

People at Google don't say "IT" (information technology) because the business & tech work closely together - IT is an integral part of the business.



@LukaDotNet

2019,

LUCA MINUDEL & PAOLO POLCE

In nowadays digital economy

the Business & Tech

are one and the same



@PAOLOPOLCE



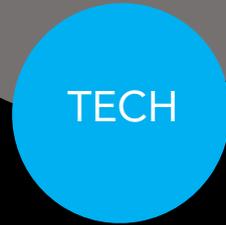
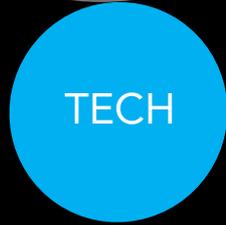
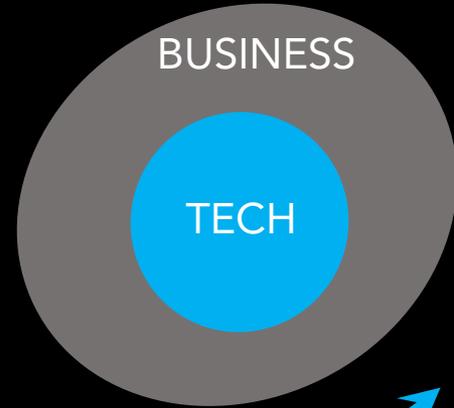
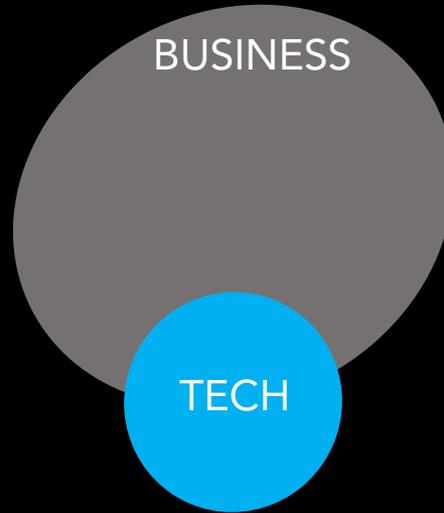
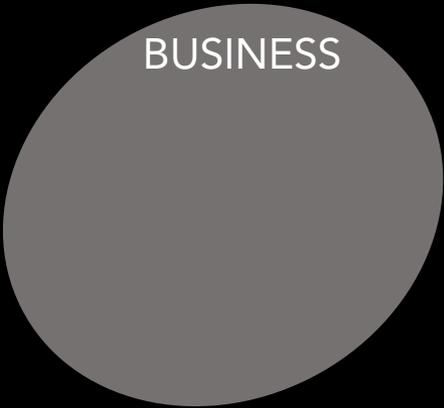
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ENABLING

SUPPORTING

DIFFERENTIATING

ONE & THE SAME

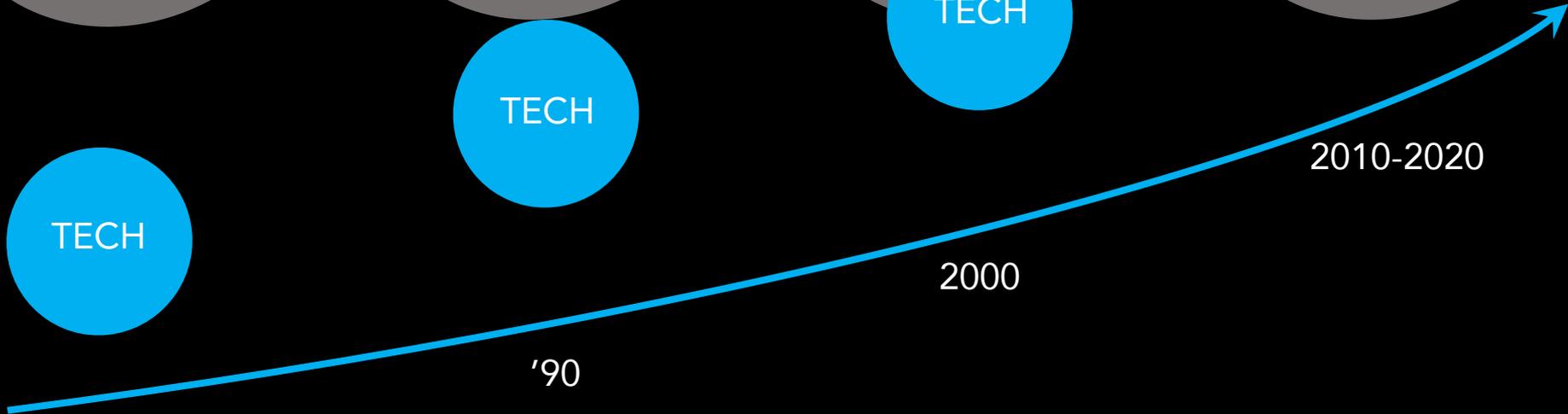


2010-2020

2000

'90

'80



TECHNOLOGY

To Technical excellence



From Continuous Improvement

UPWARD =>

F1 TEAM

To winning races



From a good driver, car, team

F1 TEAMS' TECH EXCELLENCE UPWARD SPIRAL

TECHNICAL EXCELLENCE **DOWNWARD** SPIRAL

TECHNOLOGY

From Technical debt



To Technical bankruptcy

DOWNWARD =>

BUSINESS

From a non competitive product



To shrinking market and profits

***4 REAL-LIFE SITUATIONS,
FOR EACH ONE:***

***A HORROR STORY ... OR TWO,
A SUCCESS STORY***

SITUATION #1: RAMPING UP

> FOLLOWING THE SUCCESSFUL
RELEASE OF A NEW PRODUCT ...

SITUATION #1: RAMPING UP

... EXPANSION INTO NEW
INTERNATIONAL MARKETS,
SCALING THE # OF USERS

EXPANDING IN NEW MARKETS, SCALING THE # OF USERS

☹️ STORIES: ONE FINTECH START-UP & ONE BANK

Geographic expansion.

From early adopters to a majority of users.

EXPANDING IN NEW MARKETS, SCALING THE # OF USERS

TECH EXPECTED TO
PULL A RABBIT OUT OF A HAT



EXPANDING IN NEW MARKETS, SCALING THE # OF USERS

☹️ STORIES: ALTERNATIVE FINALE

Geographic expansion.

From early adopters to the majority of users.

EXPANDING IN NEW MARKETS, SCALING THE # OF USERS

BUSINESS FORCED TO
SLOW DOWN AND ...

EXPANDING IN NEW MARKETS, SCALING THE # OF USERS

BUSINESS FORCED TO
SLOW DOWN AND ...



EXPANDING IN NEW MARKETS, SCALING THE # OF USERS

😊 STORY: F1

From an ad-hoc solution for a specific track/race to a standard solution for every race.

Promoting experimental app with just one or few users to official app used by the whole team.

EXPANDING IN NEW MARKETS, SCALING THE # OF USERS

RELENTLESS PURSUE OF SIMPLICITY

FROM



TO



SIMPLE DESIGN
= LOW-COST
HIGH-VALUE
FLEXIBILITY



SITUATION #2: STRATEGISING

> RE-USE PARTS OF EXISTING PRODUCTS TO CREATE NEW ONES, SWITCH TO THE LATEST TECHNOLOGIES TO REJUVENATE EXISTING PRODUCTS...

SITUATION #2: STRATEGISING

...TECH IS ASKED BY BUSINESS TO
PROVIDE OPTIONS TO ENACT THE
STRATEGY _

TECH OPTIONS STRATEGIC FOR THE BUSINESS

☹️ STORIES: FAST GROWING ONLINE MARKET RESEARCH,
FINTECH

Speed up the creation of new products
reusing and integrating parts of the existing products

TECH OPTIONS STRATEGIC FOR THE BUSINESS

LIKE IT OR LUMP IT



TECH OPTIONS STRATEGIC FOR THE BUSINESS

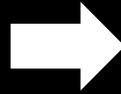
😊 STORY: F1

Switching to a different technology.

Upgrading to a newer version (tools, frameworks, language).

TECH OPTIONS STRATEGIC FOR THE BUSINESS

FROM HIGH COUPLING



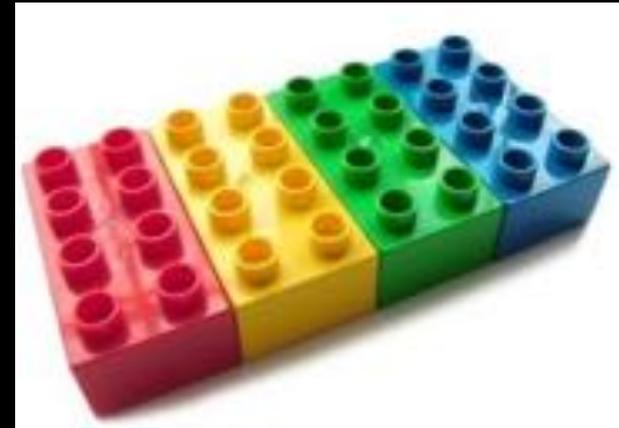
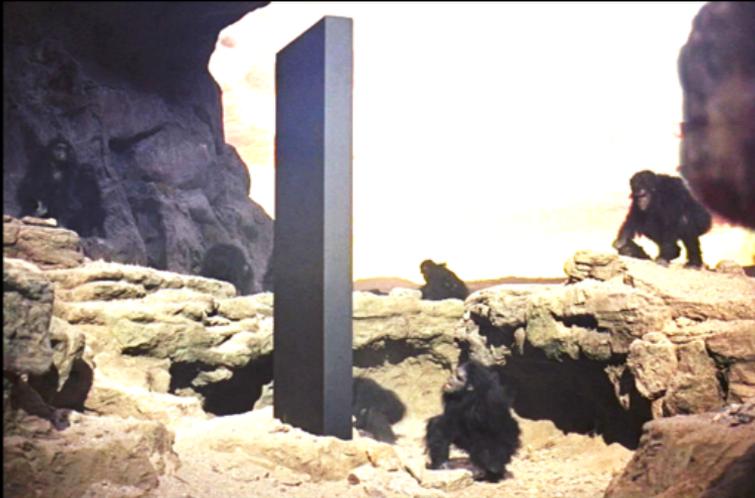
TO LOW COUPLING
WITH MINIMAL DEPENDENCIES



TECH OPTIONS STRATEGIC FOR THE BUSINESS

FROM MONOLITH

TO MODULARITY



SITUATION #3: **FASTER, CHEAPER**

> BUSINESS IS FACING PRESSURE
FROM COMPETITORS...

SITUATION #3: **FASTER, CHEAPER**

**... PRODUCT NEEDS TO EVOLVE
FASTER, TIME-TO-MARKET & COSTS
NEED TO BE REDUCED**

REDUCING COSTS & TIME-TO-MARKET

☹️ STORY: ONLINE GAMING AND BETTING COMPANY

Striving to achieve:

- More competitive prices
- Faster time-to-market
- Sustainable costs of maintenance/evolution
- Lower costs of clients acquisition

REDUCING COSTS & TIME-TO-MARKET

MAKING YOUR MOVE AT JENGA

CLIMBING A HUMAN TOWER



REDUCING COSTS & TIME-TO-MARKET

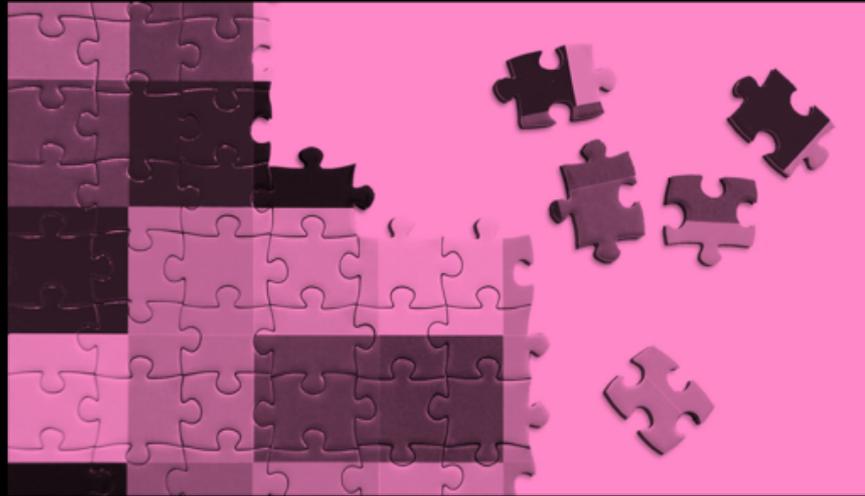
😊 STORY: F1

Want to:

- Maximise the number of features released
- Evolve a huge code-base with few & relatively small teams

REDUCING COSTS & TIME-TO-MARKET

GRADUALLY AND STEADILY COMPOSING PIECES TO SOLVE THE PUZZLE



REDUCING COSTS & TIME-TO-MARKET

FROM



TO



SITUATION #4: FINAL DESTINATION

> BUSINESS & TECH, IN A
DEAD-END RELATIONSHIP
STRUGGLE TO...

SITUATION #4: FINAL DESTINATION

...ENSURE BASIC
PRODUCT'S RELIABILITY _

PRODUCT'S RELIABILITY

☹️ STORY: SAME ONLINE GAMING AND BETTING COMPANY AS BEFORE

Needs to tackle quickly product's reliability problems while:

- Keeping customers happy
- Limiting users frustration
- Improving company reputation
- Ensuring service continuity and related revenue stream

PRODUCT'S RELIABILITY

THE HOUSE IS ON FIRE



CONSTANT FIRE-FIGHTING



PRODUCT'S RELIABILITY

😊 STORY: F1

Don't create reliability problems or any kind of extra work or extra complexity for the race team (the users).

Recover quickly from bugs and incidents in production.

PRODUCT'S RELIABILITY

SPEED AND RELIABILITY



HOW TO CRACK THE TECH DEBT: LEARNINGS FROM F1 TEAMS(*)

***(*) EXAMPLES IN CONTEXT,
NOT SILVER BULLET RECIPES***

F1 TEAMS – LESSONS LEARNED (*)

(*) EXAMPLES IN CONTEXT, NOT SILVER BULLET RECIPES

1. **A GROWTH MINDSET:**
continuously learning & improving while delivering
2. **BLAMELESS CULTURE:**
learning from mistakes, avoid repeats, remove root causes
3. **BIZ-TECH COLLABORATION & TRUST:**
...

HOW WE BUILT BUSINESS-TECH TRUST

WE (TECH) WON BUSINESS TRUST BY

- delivering tech excellence that had a tangible positive impact to the business
- sharing with the Business the responsibility of our successes as well as of our failures

OUR BUSINESS WAS OPEN TO

- understand technology implications, constraints and opportunities
- solve problems and find solutions collaborating with us

F1 TEAMS – LESSONS LEARNED (*)

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3. **BIZ-TECH COLLABORATION & TRUST:**
deliver promised benefits , share success/failure responsibility
4. **TECHNICAL MASTERY AS A STARTING POINT:**
a quick recap of forgotten lessons...

MEMO: GOALS OF TECH PRACTICES

- A. INCREASE THE SPEED OF LEARNING
- B. REDUCE THE COST OF CHANGE
- C. TAME IRREVERSIBILITY
(MAKES IT FAST AND CHEAP TO REVERSE PREVIOUS DECISIONS
AND RECOVER FROM MISTAKES)

TIPS FOR IMPROVING TECH PRACTICES

- I. FOCUS ON SPECIFIC PROBLEMS (NOT GENERIC OR UNIVERSAL)
- II. START WITH LOCAL SOLUTIONS (NO SCALING OBSESSION)
- III. START SIMPLE & EVOLVE (NOT MAXIMALIST + TAILOR-DOWN)
- IV. ADOPT A JUST-IN-TIME JUST-GOOD-ENOUGH APPROACH (DON'T TRY TO ACHIEVE PERFECTION UP-FRONT)
- V. FOCUS ON ONE THING AT THE TIME (NO MULTI-TASKING)
- VI. IF SOMETHING IS HARD, DO IT MORE OFTEN (DON'T WAIT WHILE THE PROBLEM GROWS BIGGER)

F1 TEAMS – LESSONS LEARNED (*)

(*) EXAMPLES IN CONTEXT, NOT SILVER BULLET RECIPES

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deliver promised benefits , share success/failure responsibility
4. **TECHNICAL MASTERY AS A STARTING POINT:**
not as an end
5. **TECH EXCELLENCE PURSUED IN CONTEXT:**
evolve/adapt tech excellence practices to fit what benefits biz context

TECH EXCELLENCE PURSUED IN **CONTEXT**

TECH
MASTERY

0

TECH EXCELLENCE PURSUED IN **CONTEXT**

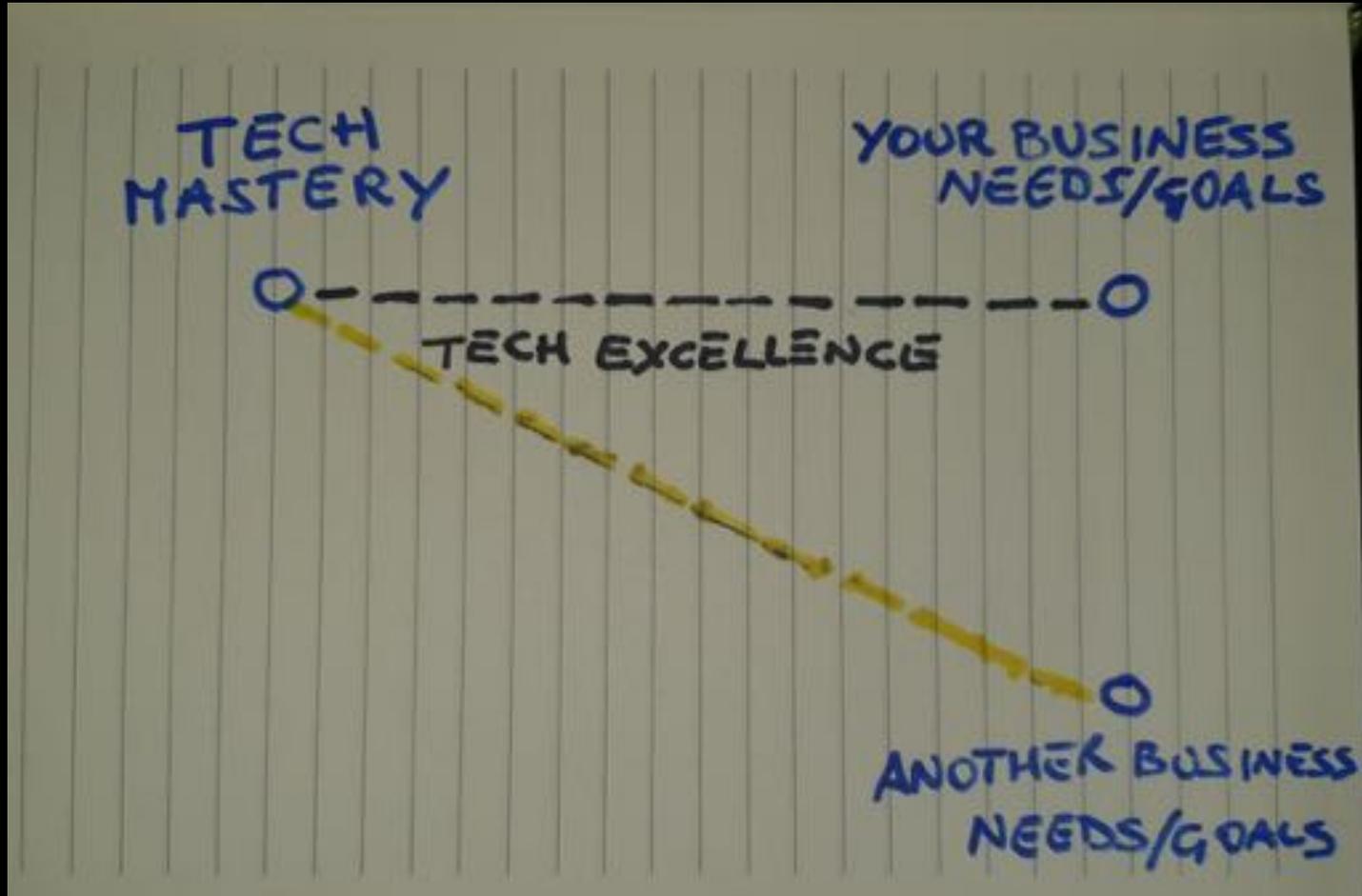
TECH
MASTERY



YOUR BUSINESS
NEEDS/GOALS



TECH EXCELLENCE PURSUED IN CONTEXT



F1 TEAMS – LESSONS LEARNED (*) @LukaDotNet

() EXAMPLES IN CONTEXT, NOT SILVER BULLET RECIPES*

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LUCA MINUDEL

*HELPING BUSINESS & TECH WORK TOGETHER,
EFFECTIVELY*

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PART 2 – OPEN MIC Q&A
=> POST AND VOTE THE QUESTIONS

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HOW F1 TEAMS CRACK TECHNICAL DEBT



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