MEDIA CLOUD TRANSFORMATION SUMMIT

in #MCTdivitel

HYPE VERSUS REALITY

Divitel

WELCOME

Hans Kornmann
CEO & Founder,
Divitel

Divitel

MODERATOR

Tuan Huynh
Chief Innovation Officer,
Divitel

Divitel

10.30 – 10.40	**Opening**
10.40 – 11.10	The 4th Industrial Revolution and it's impact on the media industry
11.20 – 11.50	Artificial Intelligence and how it is transforming media & entertainment
12.00 – 12.30	Putting a data strategy into practice
12.40 – 13.30	Lunch - tour of our extended DOC

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13.30 – 14.00   TV ecosystem disruption: a transition

                       to a new ecosystem

14.10 – 14.40   Cloud transformation use cases:

                       lessons learned from the field

14.50 – 15.50   Panel discussion

15.50 – 16.00   Closing

16.00 – 17.00   Food and Drinks / Networking

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THE 4ᵀᴴ INDUSTRIAL REVOLUTION AND IT'S IMPACT ON THE MEDIA INDUSTRY

Kirstine Stewart

Executive Committee,
World Economic Forum

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QUESTIONS & ANSWERS

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AI AND HOW IT IS TRANSFORMING MEDIA & ENTERTAINMENT

Prof. Joost N. Kok

Faculty Electrical Engineering, Mathematics and Computer Science, University of Twente.

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THE WORLD UNIVERSITY RANKINGS 153

QS STARS RATED FOR EXCELLENCE

UNIVERSITY OF TWENTE.

SCIENTIFIC OUTPUT

PUBLICATIONS TOTAL   3.098

REFEREED PUBLICATIONS   2.703

SPIN-OFF COMPANIES SINCE 1984   1.000

STUDENTS 10.435

INTERNATIONAL 2.770

BACHELOR STUDENTS 5.489

MASTER STUDENTS 4.010

EMPLOYEES 3.074

ACCOMMODATION 2.125

SOCIETIES 57

CAMPUS AREA
146 hectares

STARTING BSC WITH VU AMSTERDAM 2019

UNIVERSITY RANKINGS

153 TIMES HIGHER EDUCATION
179 QS WORLD UNIVERSITY RANKINGS
126 (EUROPE) LEIDEN RANKING

1 BEST TECHNICAL UNIVERSITY NL 2018
3 BEST UNIVERSITY 2018 NL (BSC + MSC)

1 MOST ENTREPRENEURIAL UNIVERSITY IN NL

Keuzegids Universiteiten
BEST TECHNICAL UNIVERSITY
2018

FACTS & FIGURES

UNIVERSITY OF TWENTE.

Booking.com

Thuisbezorgd.nl

WiFi Pioneer Cees Links Sets His Sights on the Smart Home

Winner of Design News' 2017 Lifetime Achievement Award says the IoT will be much bigger than the WiFi revolution.

by: Charles Murray in **Pacific Design & Manufacturing - Anaheim** on February 07, 2017

f in 🐦 ✉

Cees Links believes the Internet of Things (IoT) is waiting for the next "Steve Jobs moment."

Links, winner of the *Design News* 2017 Lifetime Achievement Award, knows about Steve Jobs moments. While making a presentation on an old-fashioned overhead projector at Apple Inc.'s headquarters in Cupertino, Calif. in 1998, Links learned how quickly Jobs could change the course of history. "He knew what he wanted," Links told *Design News* recently. "As I put foils on the projector, he talked. After two or three foils, he said, 'Is it clear what I want?' I said yes, and he stood up and walked out of the room."

Thus was born the era of WiFi's worldwide success. Jobs launched Links' wireless radio technology in the Apple iBook a year later under the name Apple Airport, igniting the spread of WiFi throughout the computing landscape.

How we made Bluetooth

Jaap Haartsen ✉

Bluetooth allows electronic devices to communicate over short distances and is used by billions of devices worldwide. Jaap Haartsen recalls the developments that led to the establishment of the Bluetooth wireless technology standard.

MOTTO

- The Entrepreneurial University
- High Tech Human Touch

- The University of Twente is here to empower society through sustainable solutions.
- We choose to be the ultimate people-first university of technology.

Disciplines & Themes EEMCS

- Electrical Engineering, Mathematics and Computer Science

- Human-centered Robotics
- Data Science & AI
- Energy Optimization
- Health, Wellbeing & Sports

Faculty EEMCS

Bachelor Education

Applied Mathematics
Computer Science
Electrical Engineering

Business Information
Technology
Creative Technology

AI & DATA SCIENCE

THE COMPUTATIONAL TURN

Correlations follow directly from the data

- Availability of large quantities of data
- Large progress in methods
- Excellent computational infrastructure

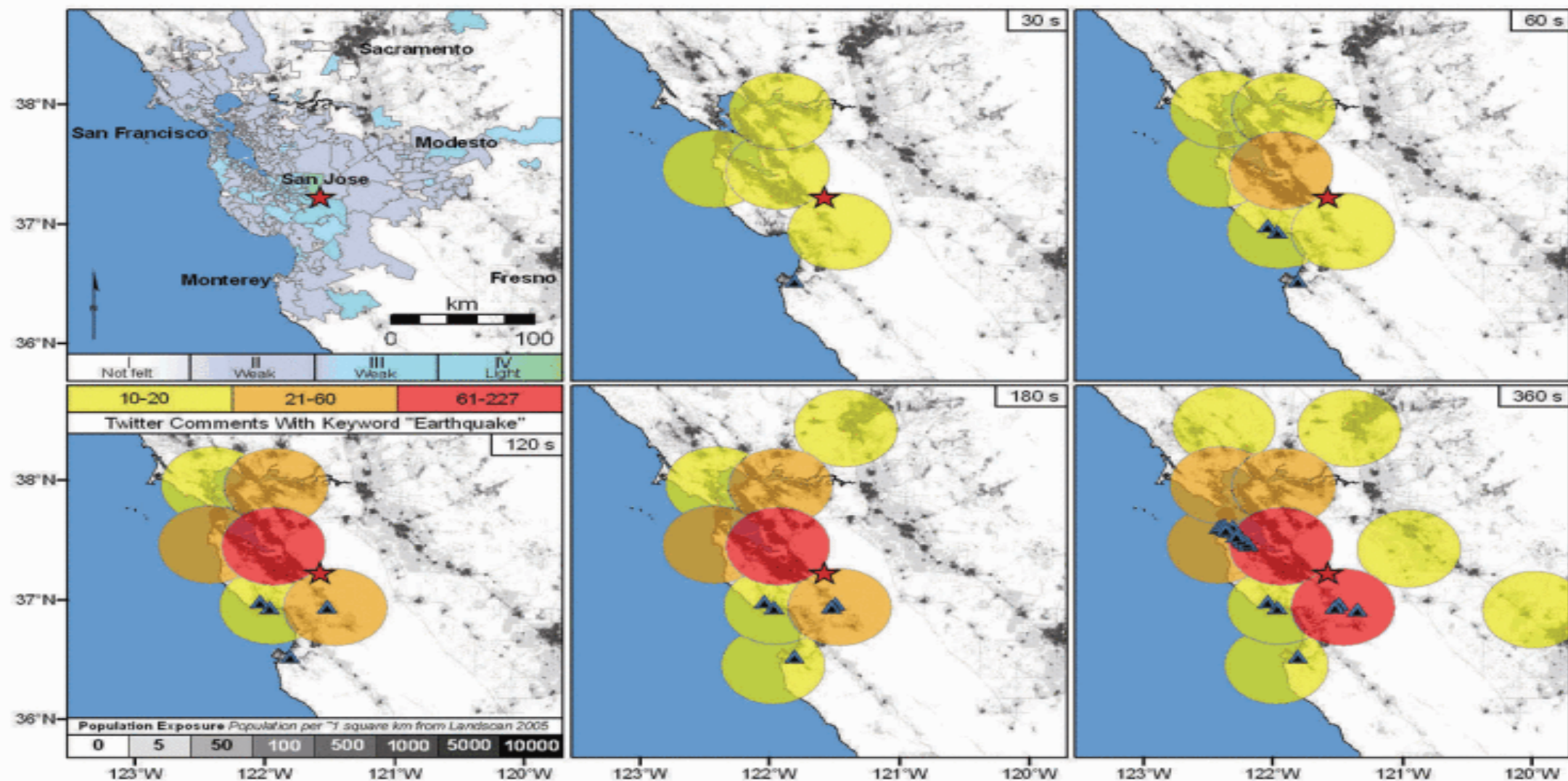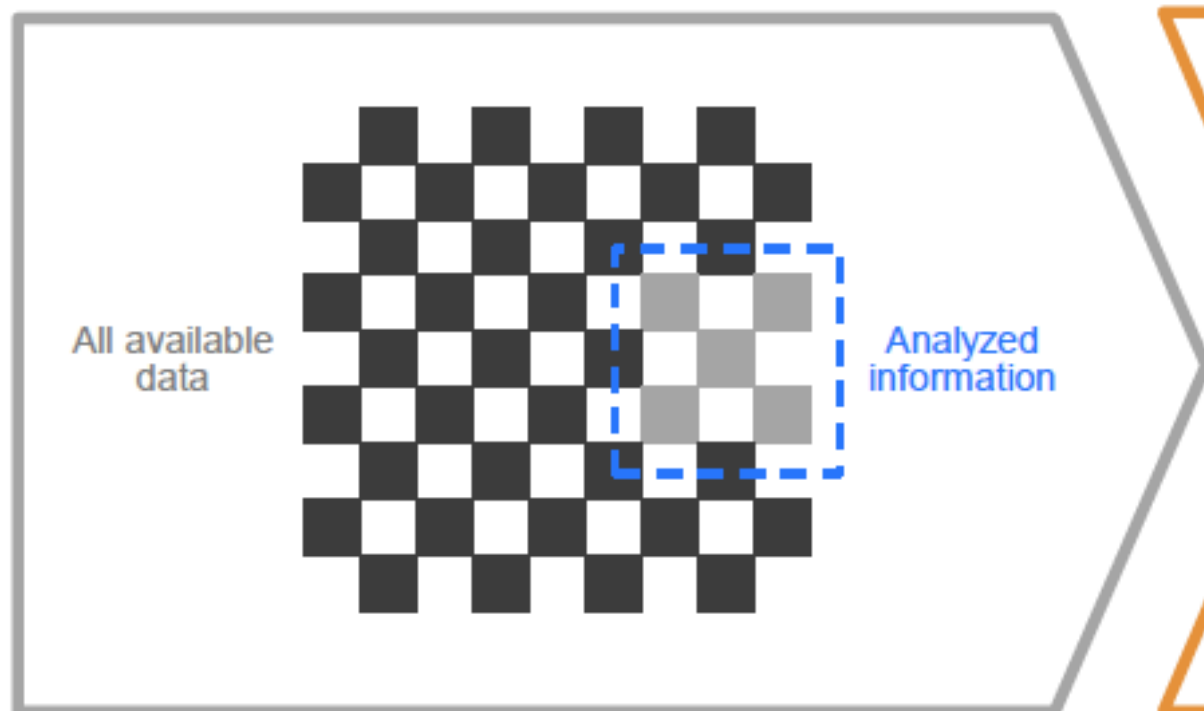Reason about the correlations to find the causal structures

Not felt | II Weak | III Weak | IV Light

10-20 | 21-60 | 61-227

Twitter Comments With Keyword "Earthquake"

Population Exposure *Population per 1 square km from Landscan 2005*

0 | 5 | 50 | 100 | 500 | 1000 | 5000 | 10000

Figure 1. Correlation between Countries' Annual Per Capita Chocolate Consumption and the Number of Nobel Laureates per 10 Million Population.
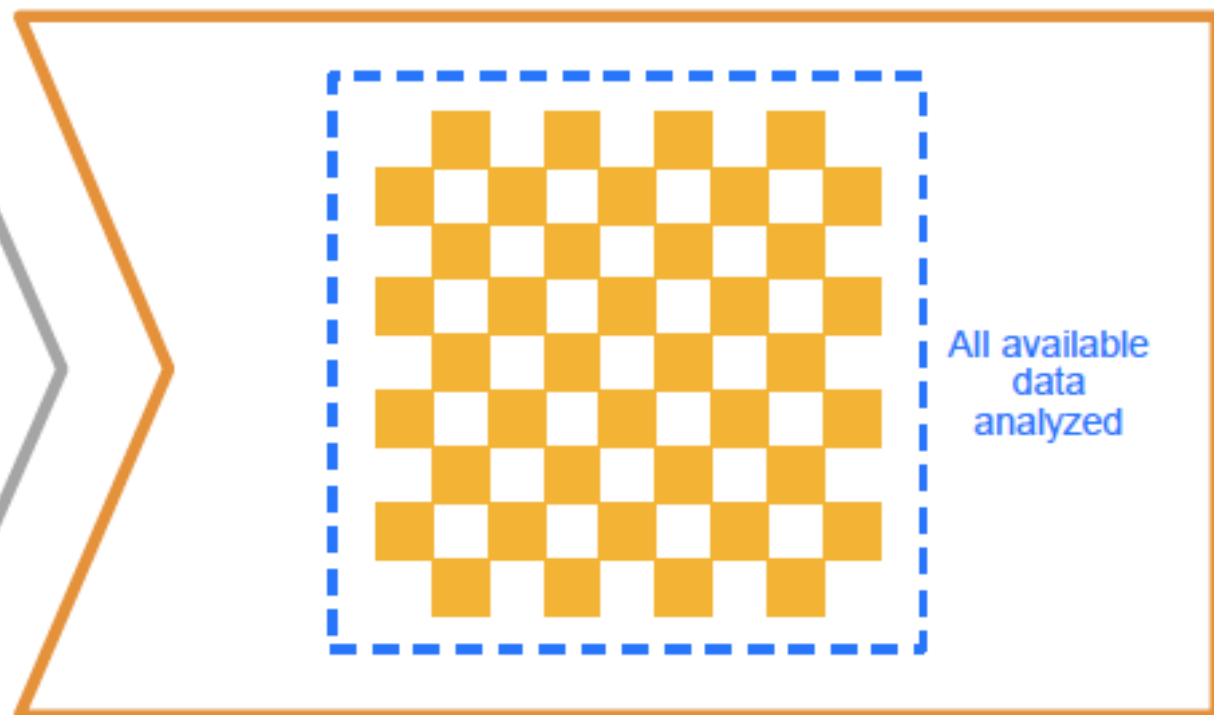
New England Journal of Medicine (Messerli, 2012)

Incorrect

Ice-Cream Sales →(+) Murder Rate

Correct

Ice-Cream Sales (+)← Temperature →(+) Murder Rate

TRADITIONAL APPROACH

All available data

Analyzed information

Analyze small subsets of data

BIG DATA APPROACH

All available data analyzed

Analyze "all" data

TRADITIONAL APPROACH

Data → Repository → Analysis → Insight

Analyze data *after* it's been processed and landed in a data warehouse or data mart

BIG DATA APPROACH

Data → Analysis → Insight
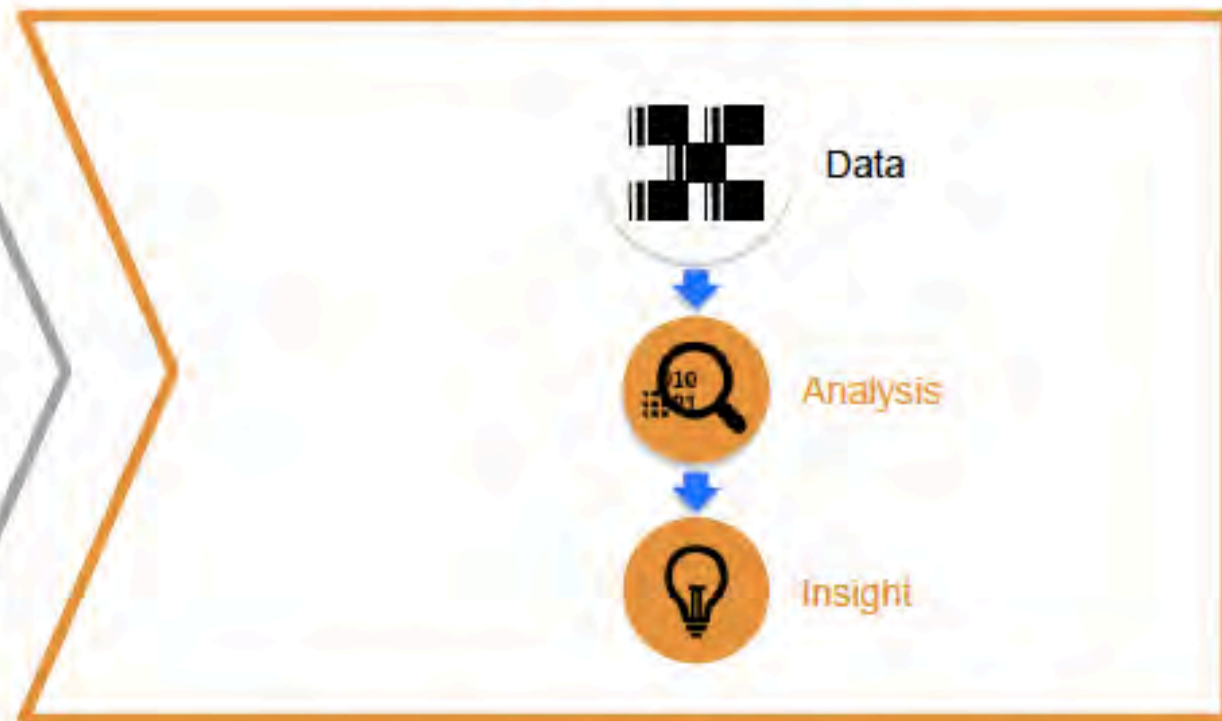
Analyze data *in motion* as it's generated, in real-time

Developments at Twente

- Focus: AI & Hardware
- Technical University of the East of the Netherlands

- Bachelor:
  - Electrical Engineering Human Touch

- Master:

  - Interaction Technology
  - Robotics
  - Sport Data Science

SCISPORTS

virtuagym

HYPERCUBE
BUSINESS INNOVATION

MYLAPS
SPORTS TIMING

EatMyRide

GRACENOTE
SPORTS

Data analysis is really helping the Dutch national women's football team

10 July 2017

The European Football Championship for Women, in the Netherlands this summer, is the background for a large and innovative data research project. The Dutch football union is working together with Leiden University and Sportinnovator. The research is expected to uncover links that have thus far remained hidden.

Optimise the game

To be able to perform optimally in top sport calls for optimal conditions. In the past, good shoes and a decent ball were enough, but today help comes from super computers. Scientists at Leiden University's Sport Data Center know how to use the data to optimise the game. A large data study is expected to give new insights.
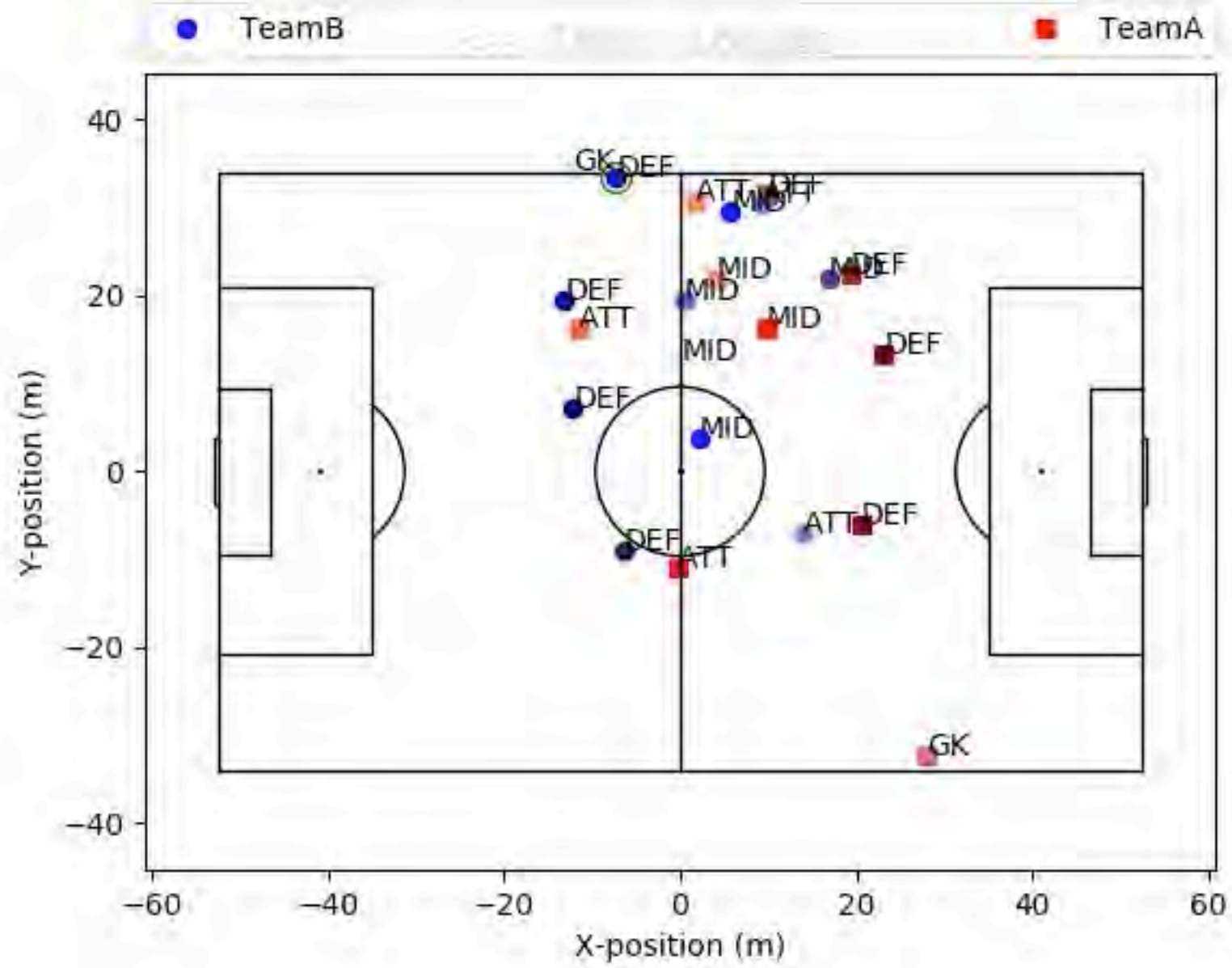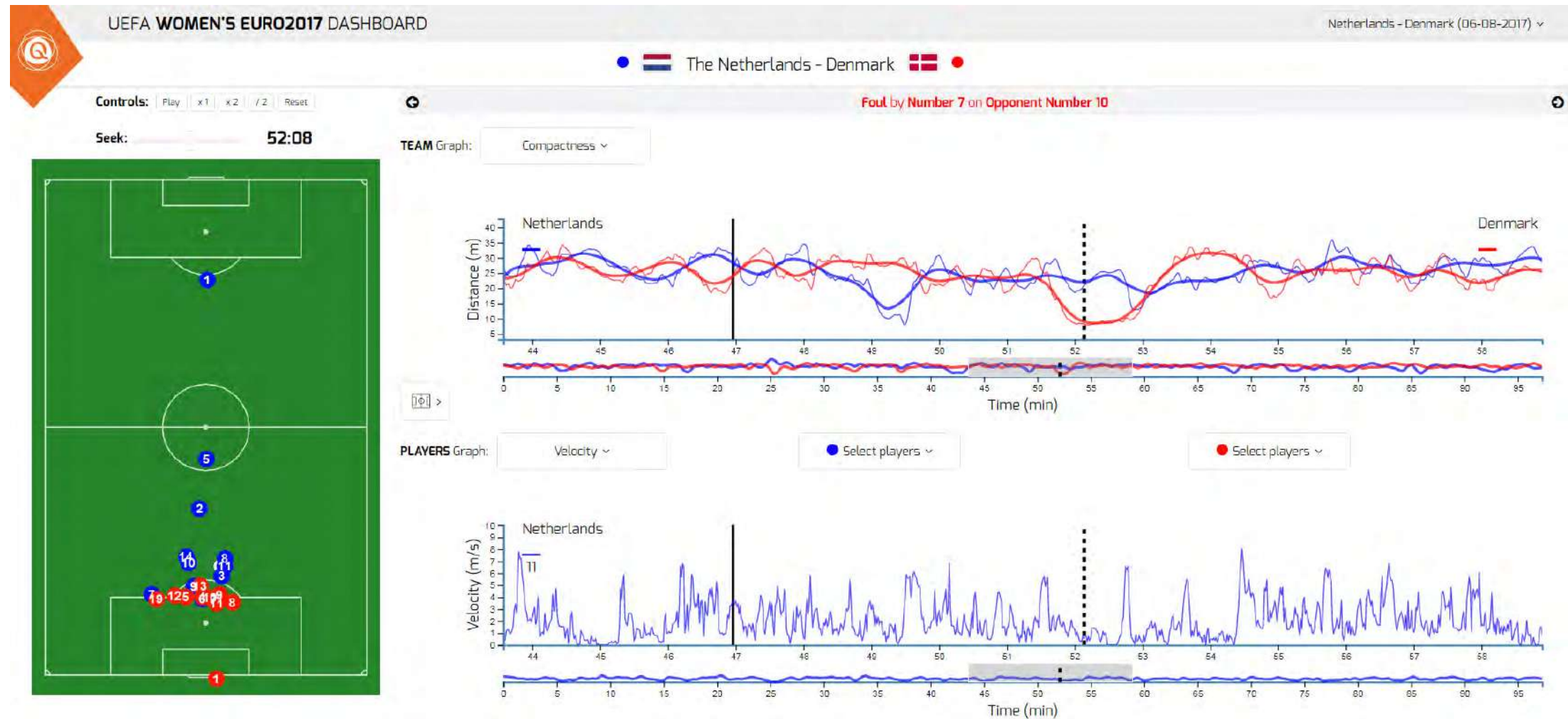
PERFORMANCE ANALYSIS DASHBOARD
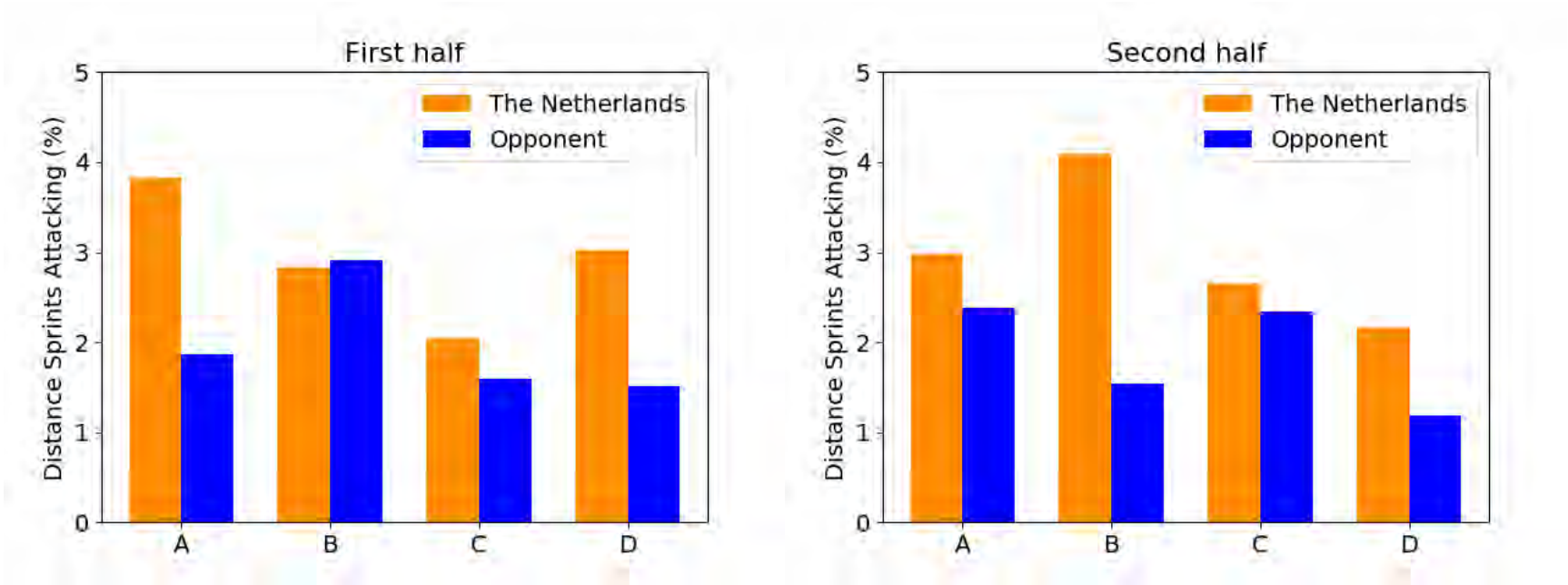
HTTPS://FFBPAD.APPSPOT.COM/   HTTPS://TINYURL.COM/SOCCERLAB

SPRINTS

ATTACKING: DISTANCE > 24 KM/H
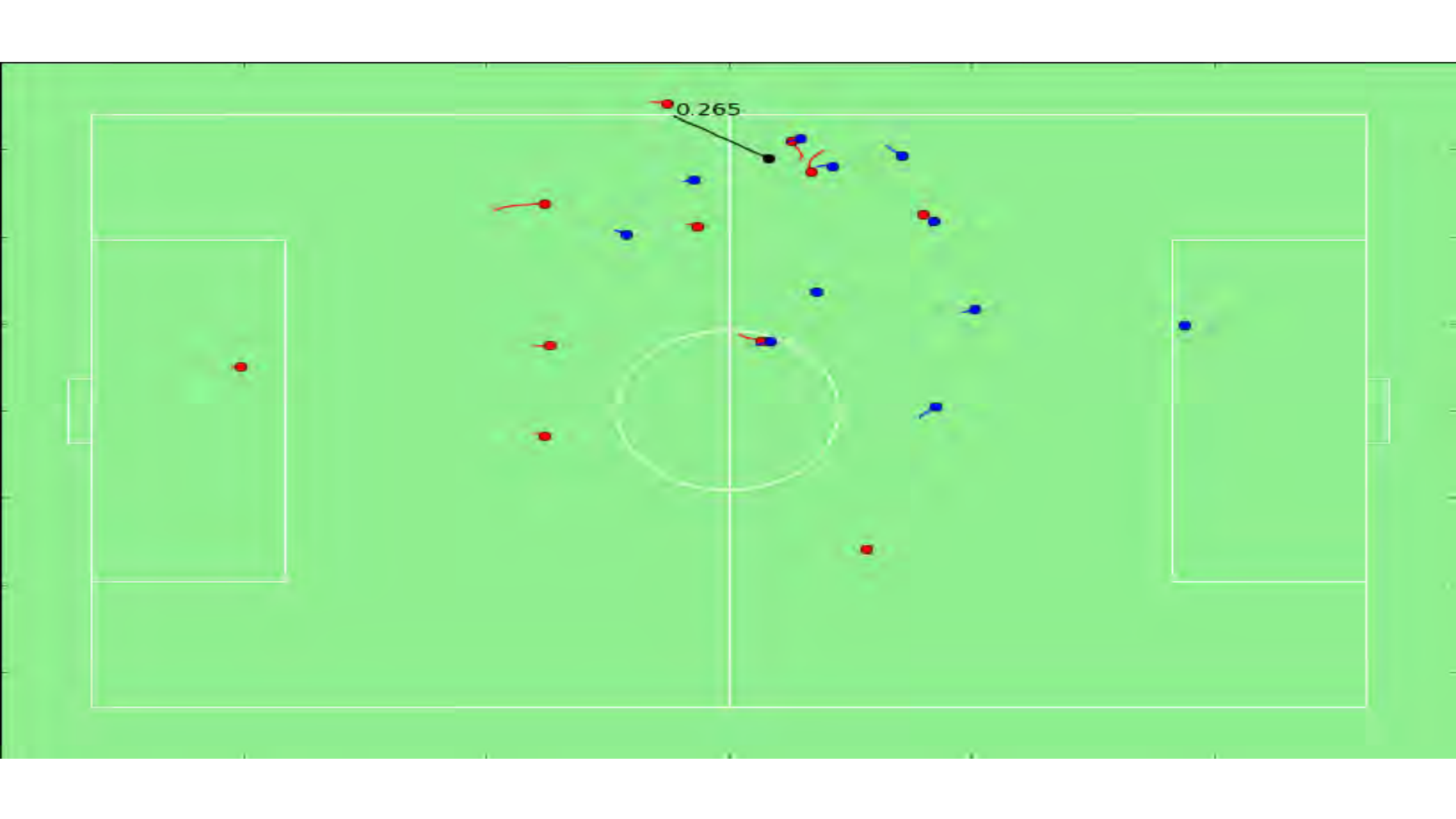
EVENT PREDICTION

IN-GAME, NEAR REAL-TIME
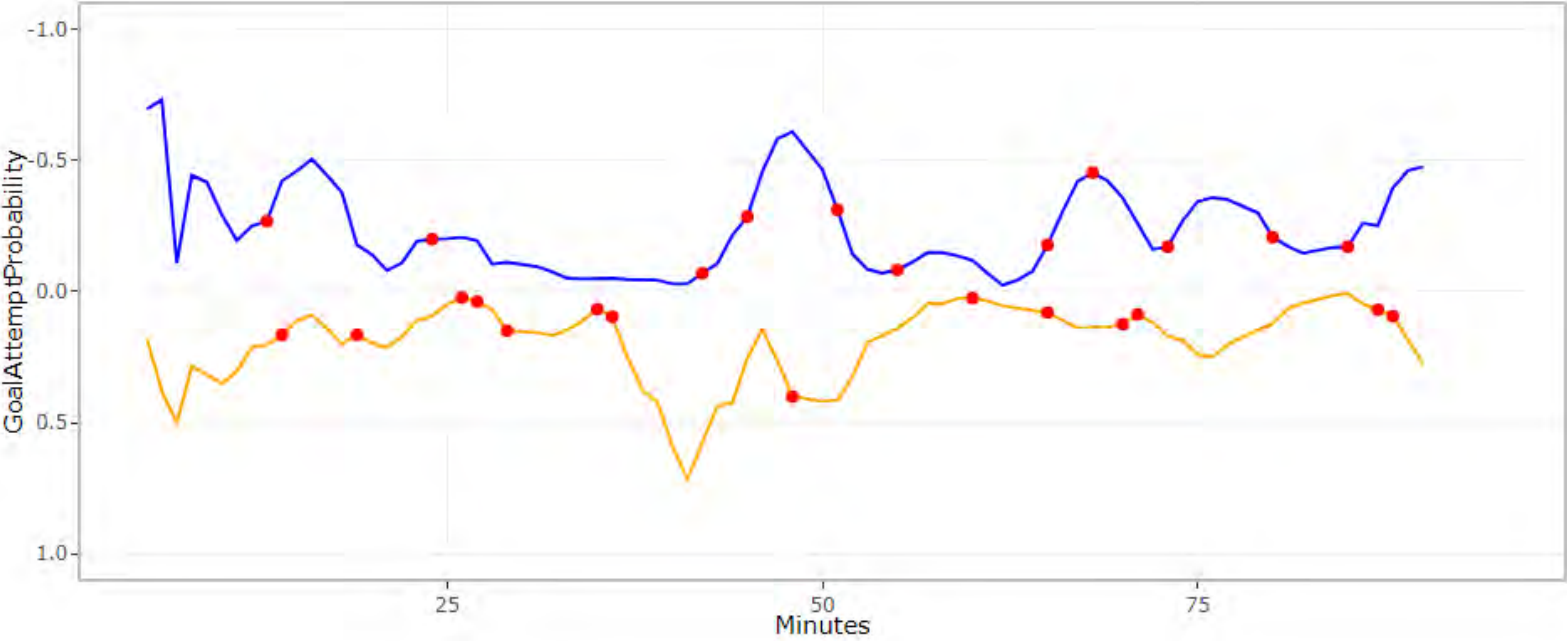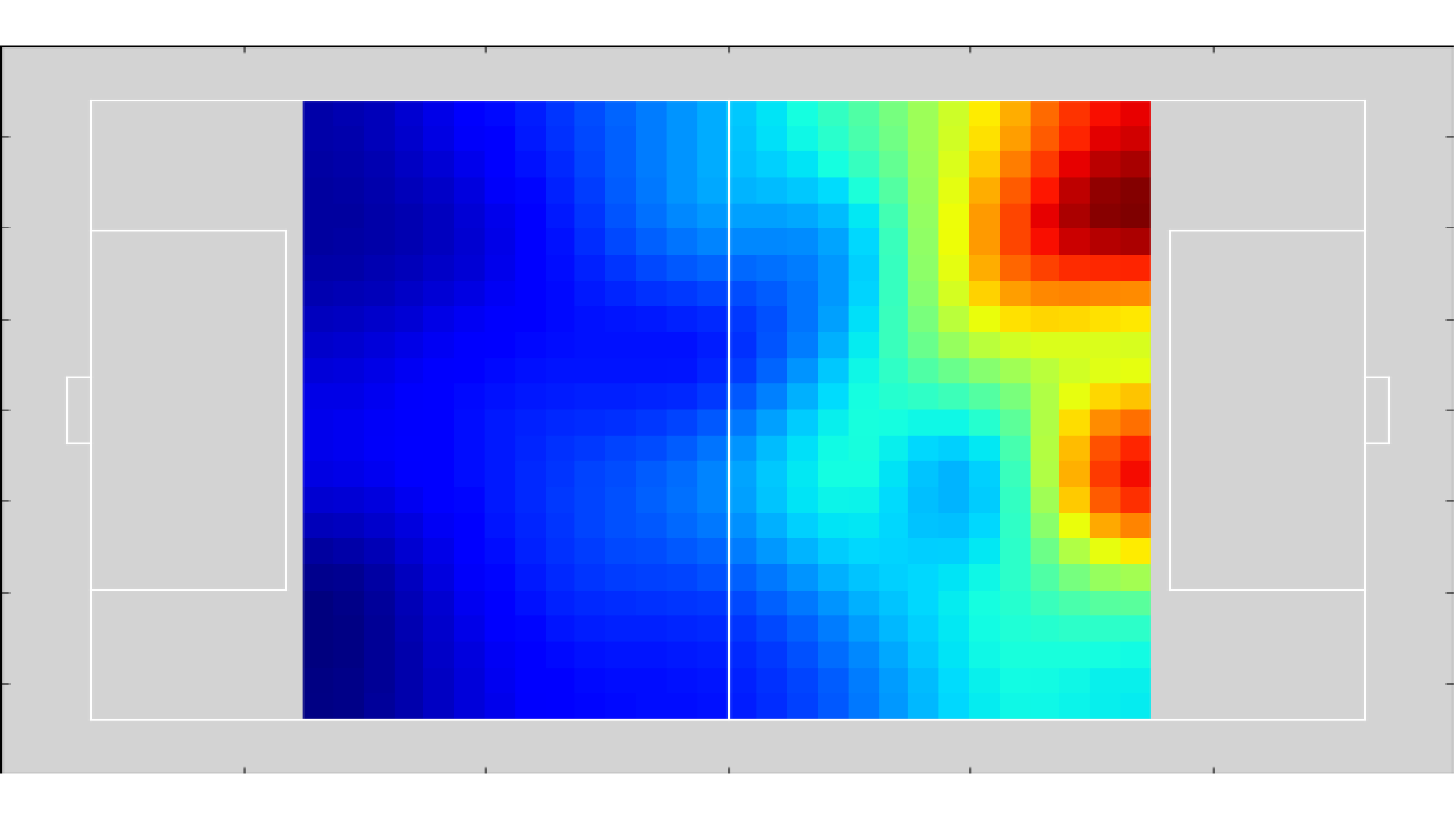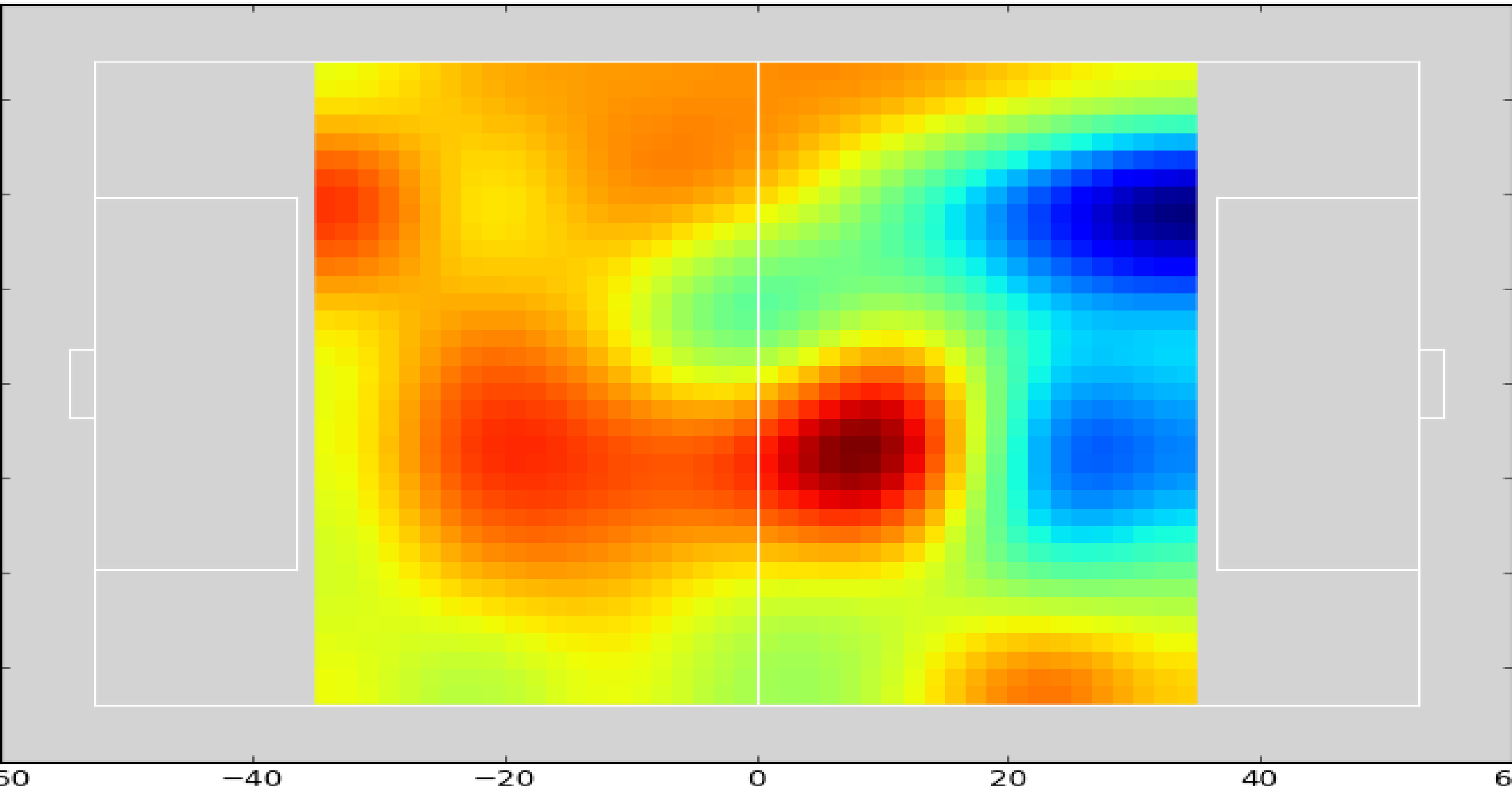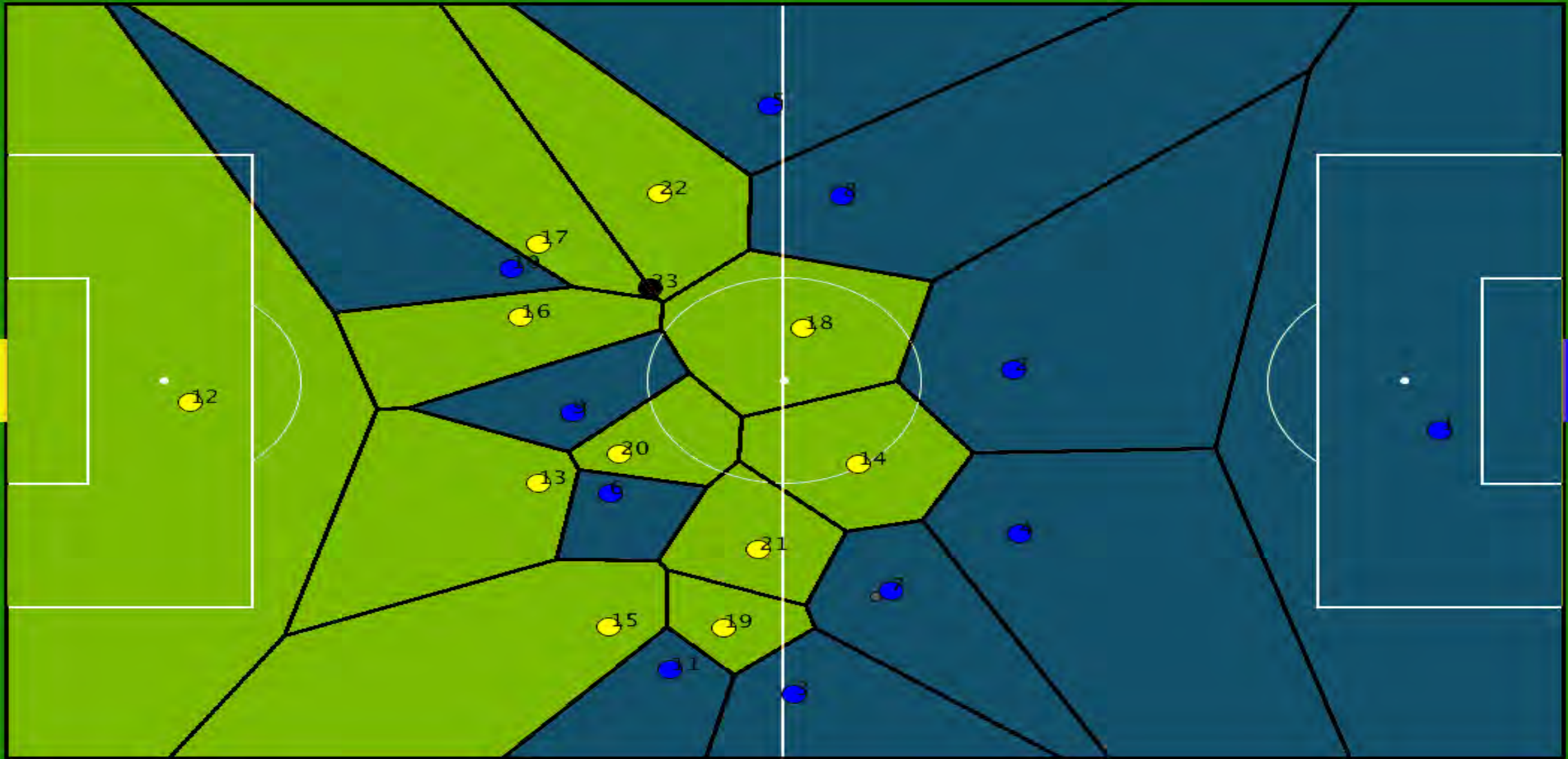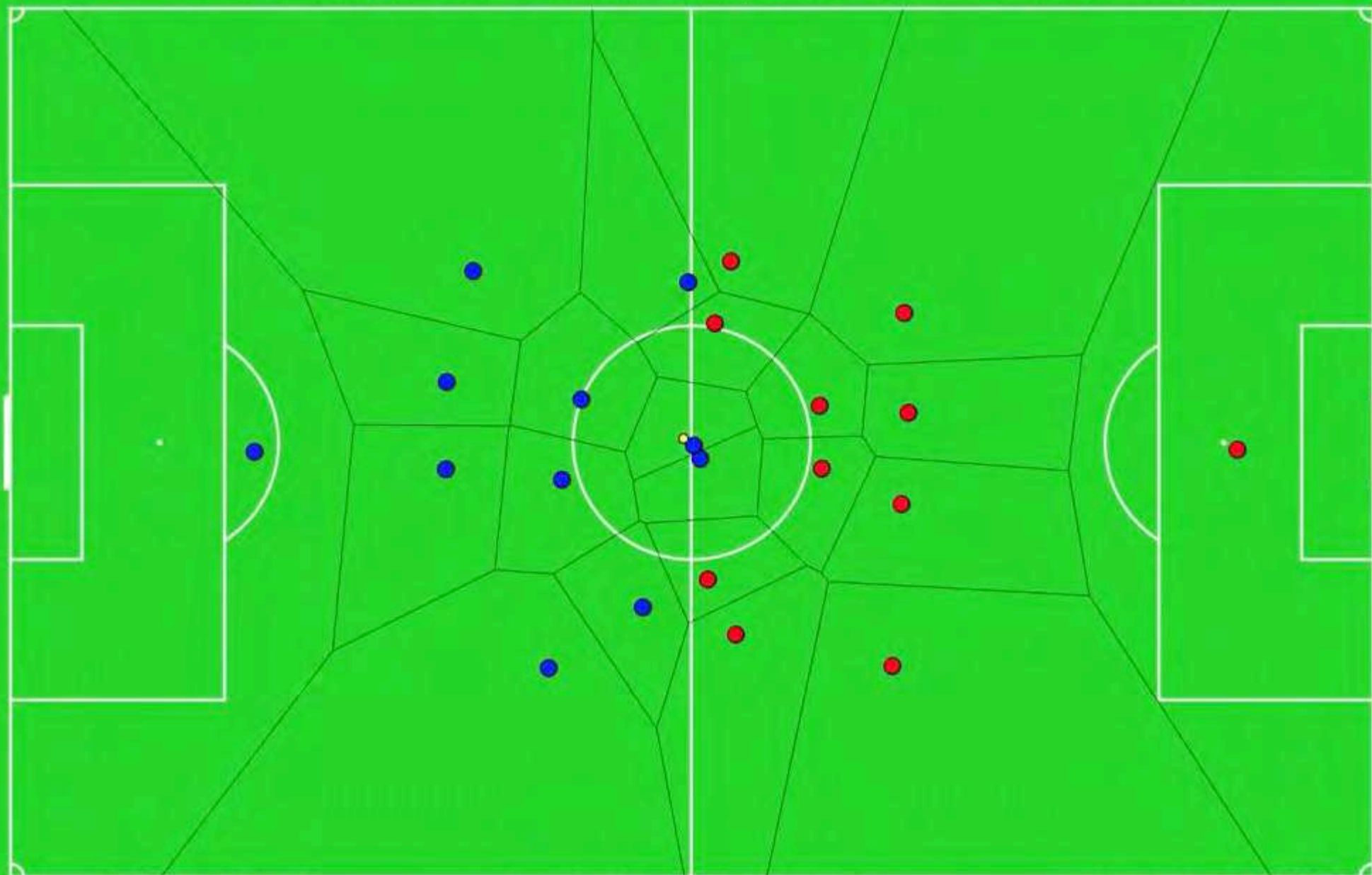
SECTORIAL AREA - TEAM A (m²)		SECTORIAL AREA DIFFERENCE (m²)	SECTORIAL AREA - TEAM B (m²)	
Defenders	1662	54	Defenders	1608
Midfielders	401	306	Midfielders	707
Forwards	99	24	Forwards	123
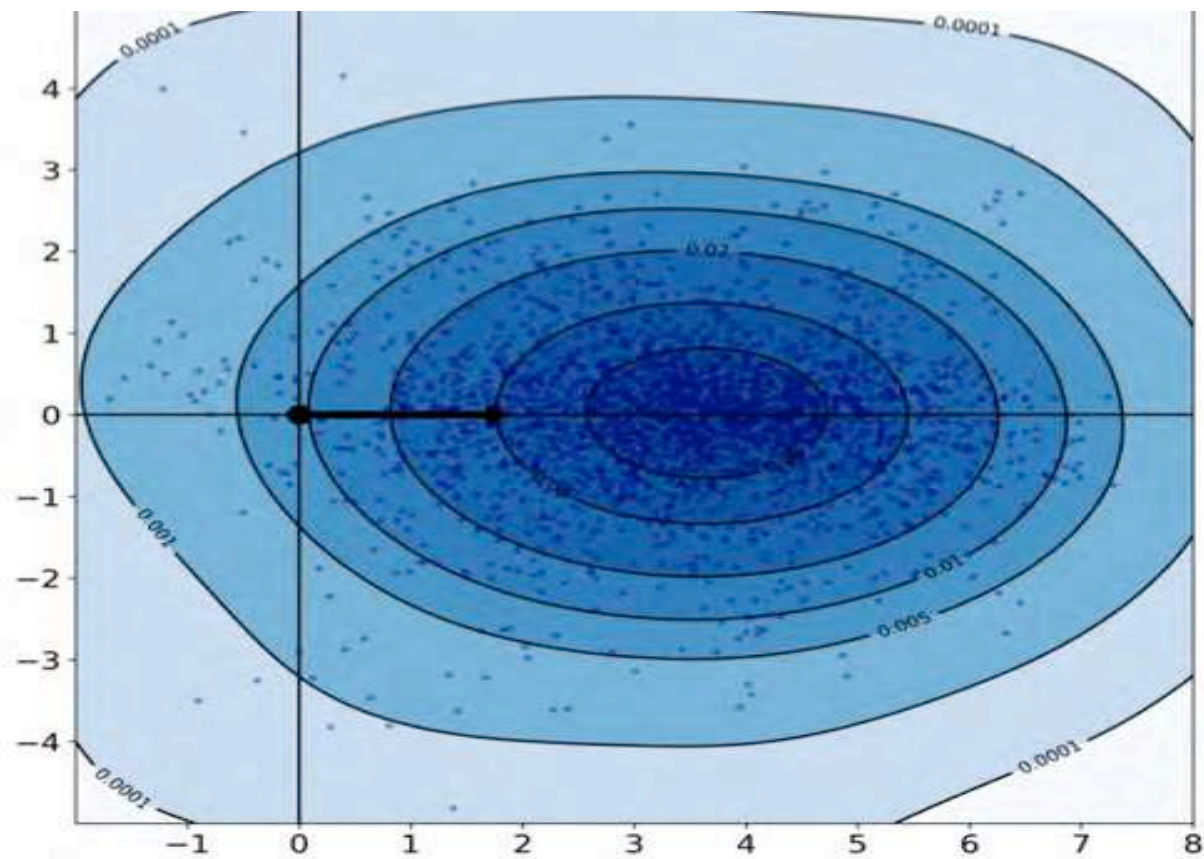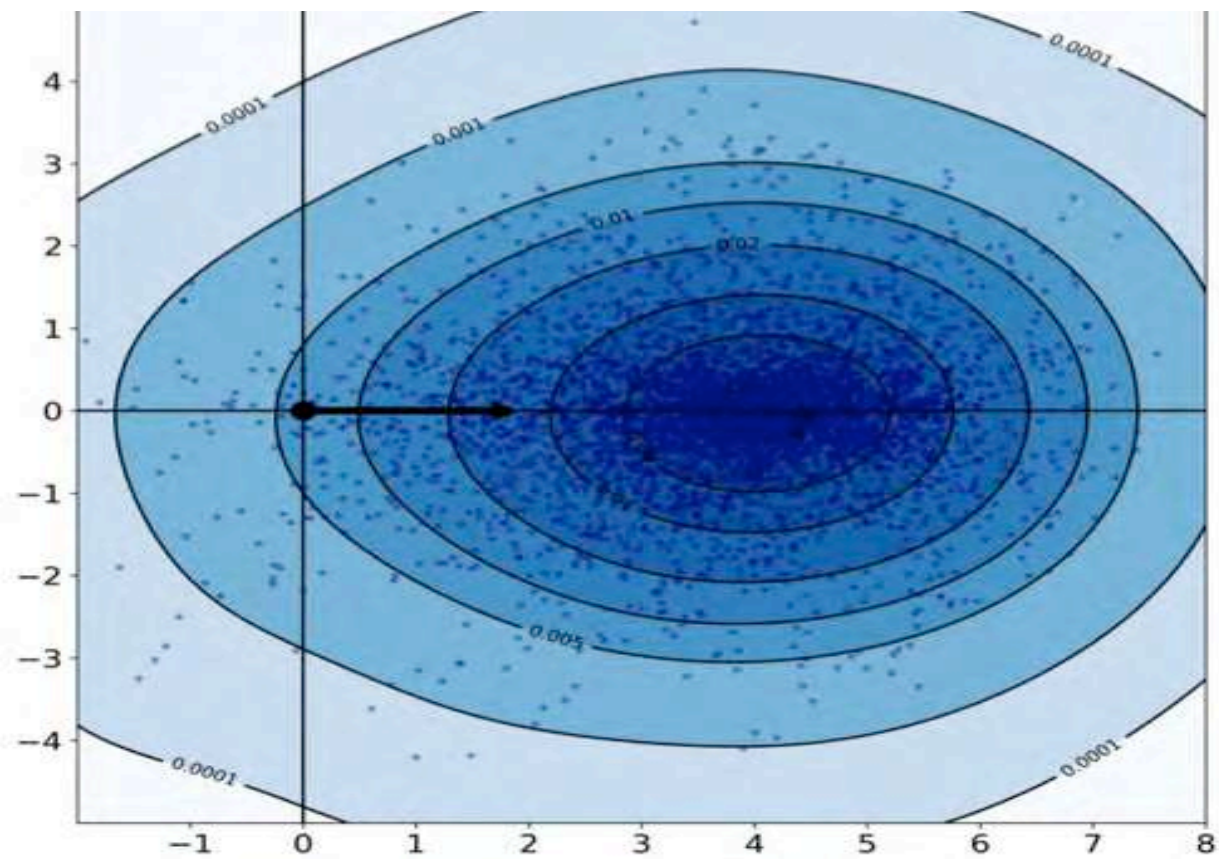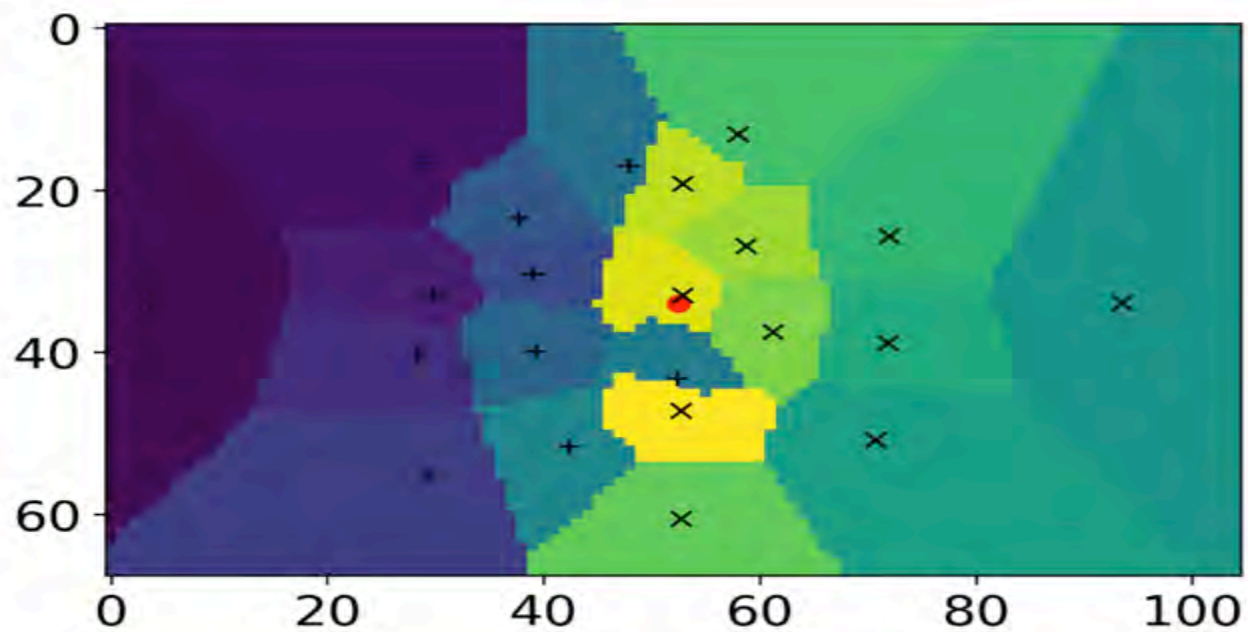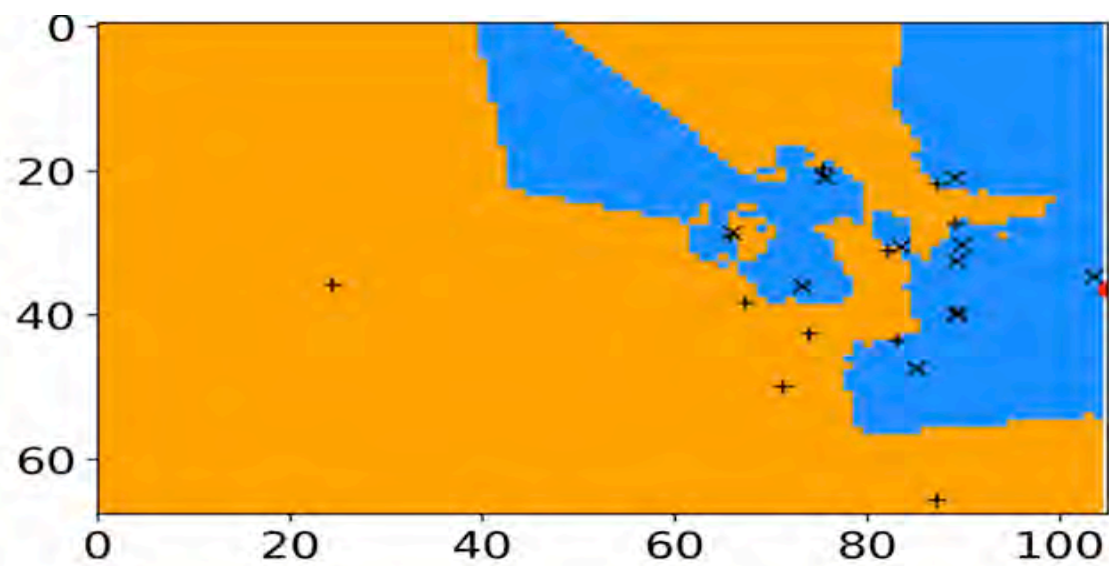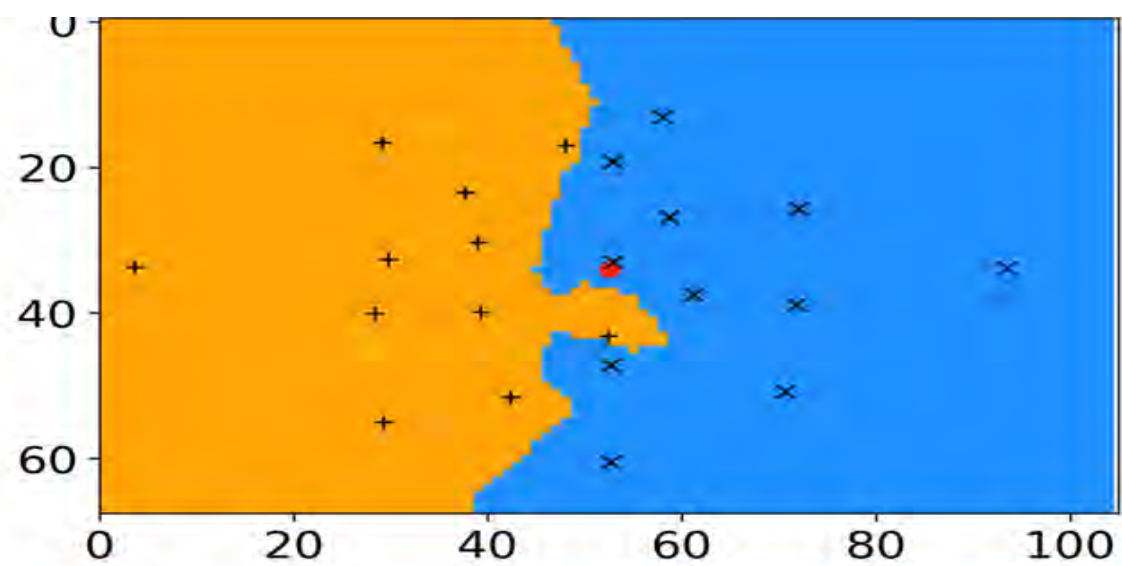
Streaming in Sports

- Streaming video from cameras
- Real-time recognition through Artificial Intelligence
- Everybody -> Subgroups -> Individuals
- Enables:
  - Automated summaries
  - Augmented videos (information, predictions, advertisements)
  - Changes of content (deep fake)
  - Search

MILITARY BOEKELO ENSCHEDE

Military in Boekelo maakt kennis met het Event Information System

Event Infortainment System Military Boekelo

Why is Infostrada Sports changing its brand name to Gracenote?

Gracenote acquired both Infostrada Sports and SportsDirect in May 2015. Gracenote is respected around the world as a global leader in entertainment data and technology and has a powerful brand in the U.S. and around the globe. Changing our name to Gracenote and operating as a single brand will make it easier to integrate products and operations with Gracenote and communicate with customers, partners and the public.

Infostrada Sports and SportsDirect will form the foundation of the new Gracenote Sports business. Combining the data catalogues of both Infostrada Sports and SportsDirect makes Gracenote the first true global sports data provider, with coverage for the world's top events, leagues, teams and players. In addition, this move now positions Gracenote as the only global provider of data for the most pervasive and popular forms of entertainment – Music, Movies, TV and Sports.

Entertainment...

Highlights of all competitions as standard

As a result of smart software all games are automatically summarised, you do not have to edit the footage anymore! These match summaries can be viewed straight after the game, and are displayed in the clubhouse on a large 55-inch screen that you receive from us. With 360Export you can also make video clips to share on the club website, social media, and

Summaries of matches

Unique content in the clubhouse: summaries of all matches, of all teams. Every week.

Recordings are from the club

And they will stay that way. We ensure that the recordings are stored securely for you. The club determines who gets access.

Income through sponsorship

Place for six sponsor logos that the club can enter itself, in order to generate new income in this way.

Streaming in Sports

- Streaming video from cameras
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ESPORTSLAB AT UNIVERSITY OF TWENTE UNIQUE INNOVATION TRAJECTORY WITH EDIVISIE

QUESTIONS & ANSWERS

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PUTTING A DATA STRATEGY INTO PRACTICE

Wouter Slot

Chief Operations Officer,

Divitel

#MCTdivitel

"I have to change to stay the same"

Willem de Kooning

Aim to connect all production means to enable their interaction in real time.

Communication among the different players and connected objects in a production line are made possible by technology such as:

CLOUD

BIG DATA ANALYTICS

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A company moving **200x** faster, has **200x** the opportunity to learn and improve based on feedback.

These companies are **2x** more likely to exceed profitability, market share and productivity goals, and having a **50%** higher market cap growth over 3 years.

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SERVICES

"Frontier" firms

Everyone else

40%

30

20

10

PRODUCTIVITY SERVICES

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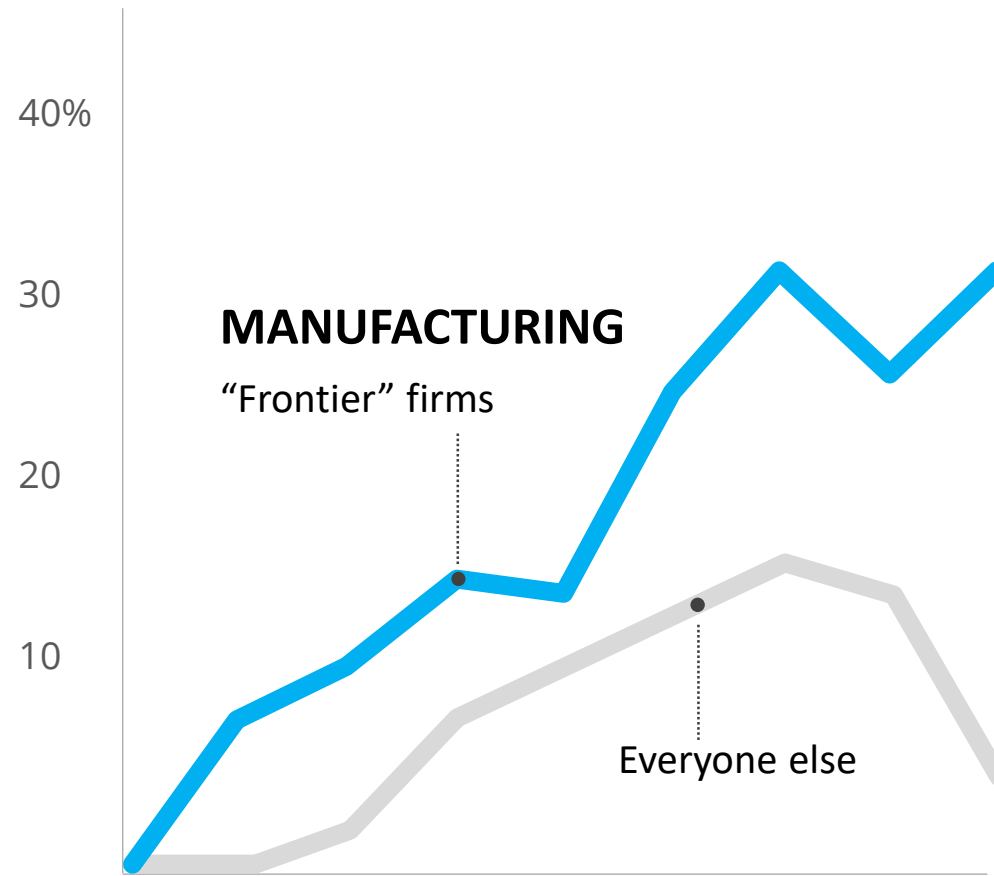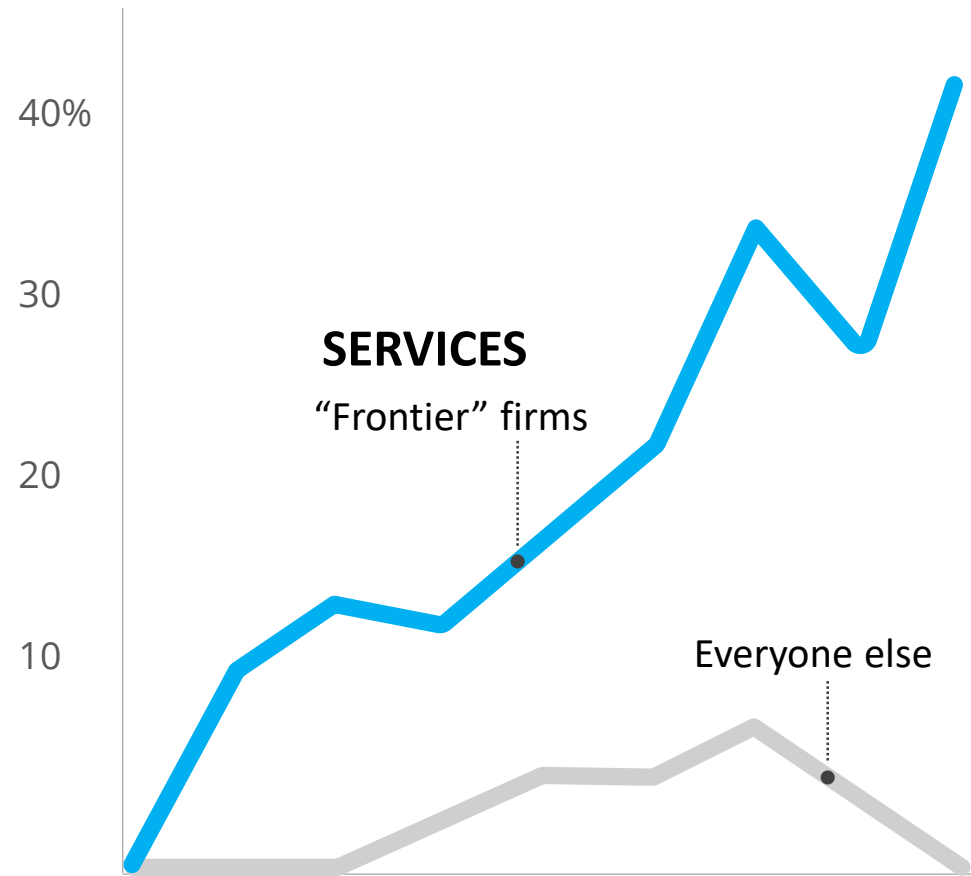
- Production depends on completing a series of tasks

- Failure or quality reduction of any task reduces the value of the entire product

- You can't substitute quantity for quality

▷ **Divitel**

Small Differences in Quality
Generate Large Differences in Wages
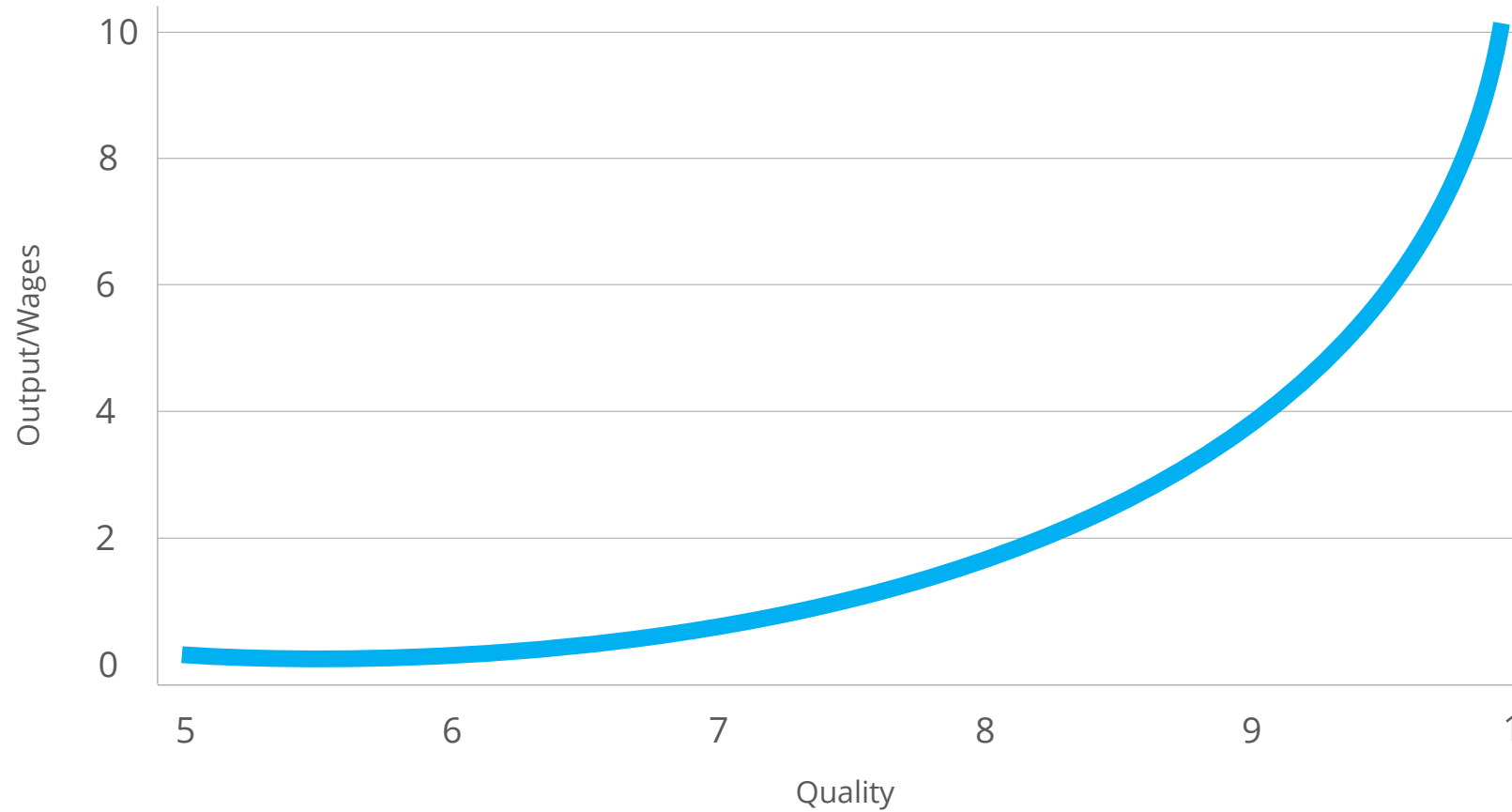
Divitel architecture framework – OTT native cloud platform

Business Performance Insights

Content production
- MAM
- Live events
- Cue tones / schedules / Ad insertion Content replacement

Content Acquisition
- EPG
- LinearTV (IP; SAT, etc)
- VoD asset (video + meta data)
- Ad insertion

Video customer care: Local
- CRM
- Ticketing
- OSS
- BSS

Video customer care: Online
- CRM
- Ticketing
- Payment provider
- IDP

Video control plane: Backend
- Products & subscriptions
- CDN selector
- Content Staging
- IAM
- Ad insertion Content replacement
- CMS
- Multi DRM
- User data

Video control plane: Frontend
- CMS
- Registration/ authentication
- Recommendation
- User behaviour Analytics

Video plane: Content Processing
- Origin
- On the fly packaging
- LinearTV transcoding
- Analytics
- On demand transcoding
- Storage

Video plane: Content Delivery
- CDN Selection
- CDN Caching / streaming
- Watermarking
- Video usage analytics
- Ad insertion Content replacement

Delivery network
- DPI
- DDoS Protection
- Abusive host containment
- Capacity & usage monitoring
- Application analytics
- Device Insights

End user Devices
- mobile devices / Phones / Tablets
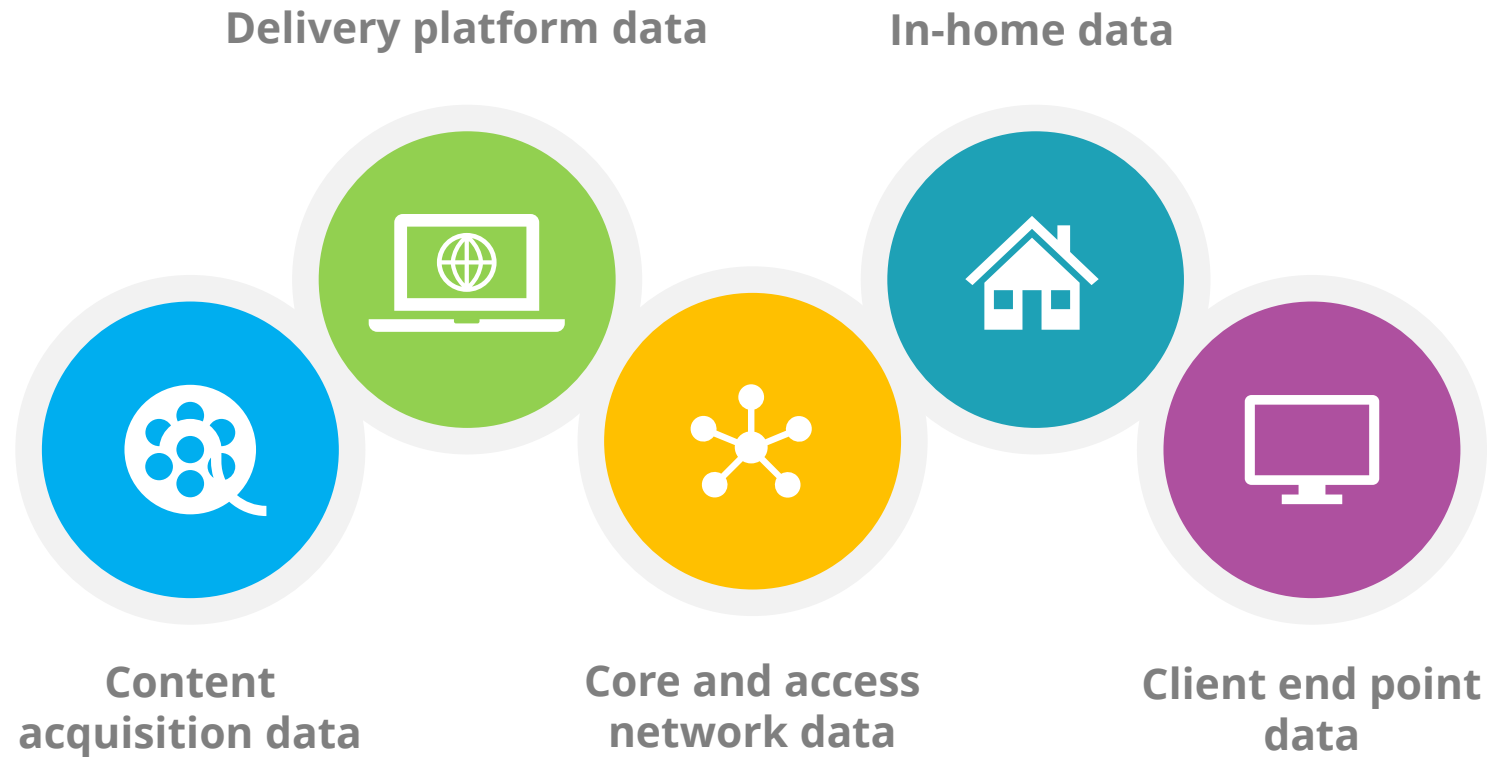- PC / MAC
- TV / SmartTV / AndroidTV / AppleTV / Roku / FireTV
- Game consoles
- STB / OTT / Hybrid
- Casting / Chromecast / Airplay

Data intelligence plane
- Data collection
- Service Availability, Reliability & Capacity
- RCA - Analytics
- QoS / QoE
- Dashboarding Service KPI's
- DMP
- OIP

- Creating Situational Awareness

- Improved decision-making in real time

- Improved coordination among departments

- Day after day, gradually optimizing production tools, quality and endless possibilities towards the future
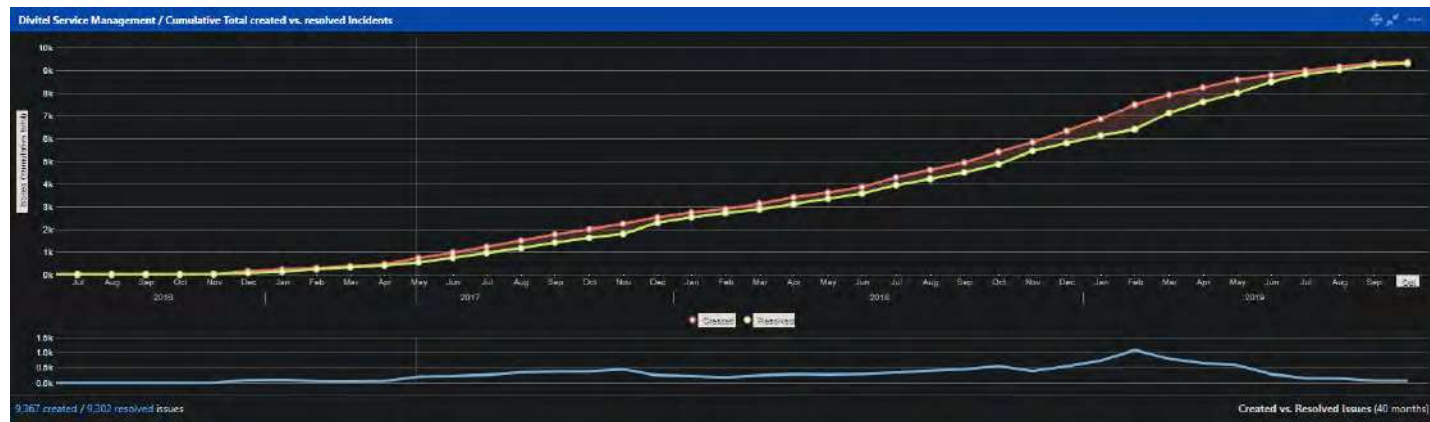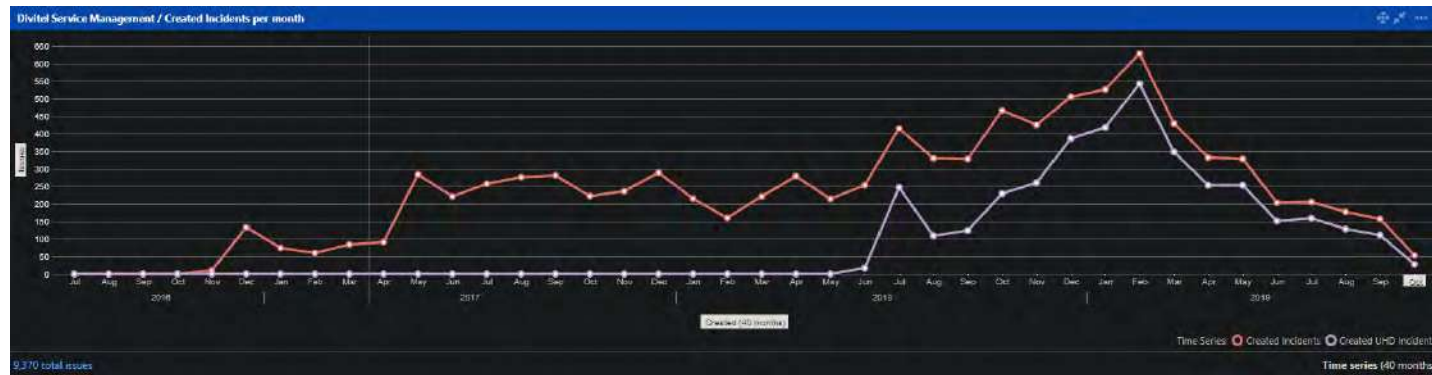
Divitel

OUR IMPACT

▶️ **Divitel**
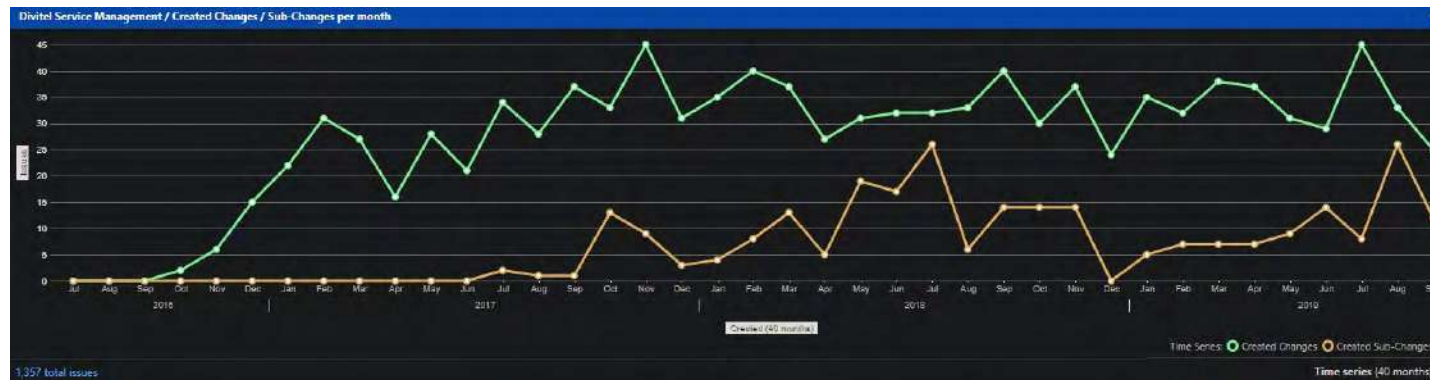
- **80%** faster RCA

- **65%** less tickets

- **50%** faster MTTR

- **40%** more first-time-right

- NPS from –28 to **+26**

- Increased customer satisfaction

- Higher investments due to higher trust

- Growing customer base

- Less likely to churn

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LESSONS LEARNED

LESSONS LEARNED (1)

Digital requires the sharing of data across ecosystem channels.

That data is now coming from multiple applications and solutions.

Cloud is the most flexible and cost effective way to connect and share all of the data.

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LESSONS LEARNED (2)

Cloud and data strategy are the foundation and backbone to digital transformation.

Digital needs a carrier of the massive amounts of data coming from people, places and things and across ecosystem partners that is scalable and flexible.

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LESSONS LEARNED (3)

Cloud is a must!

The need for scalable, flexible, and cost effective options for data management is critical.

Cloud allows IT to support the rapidly changing needs of the business and support the IT architecture.

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LESSONS LEARNED (4)

- Quality and speed are closely related

- Build a culture with a focus on quality

- Create a learning environment, where it is allowed to make mistakes

- Stop acting on assumptions

- Only act on proven facts

- Automate everything

- Innovation first!

- Move fast to fix things!

GAIN AND MAINTAIN A COMPETITIVE ADVANTAGE IN THE MARKET

Be relevant now and in the ever changing future!
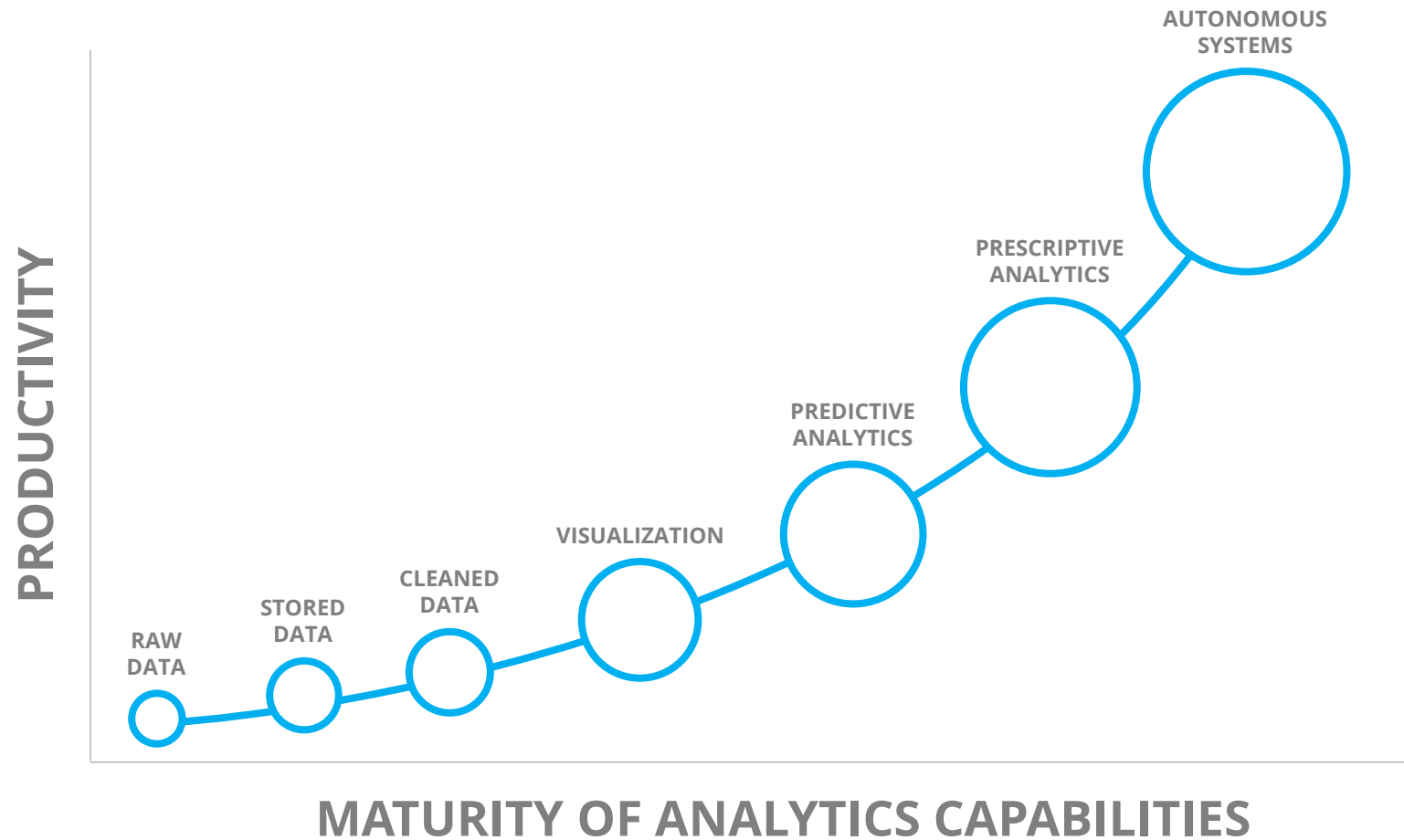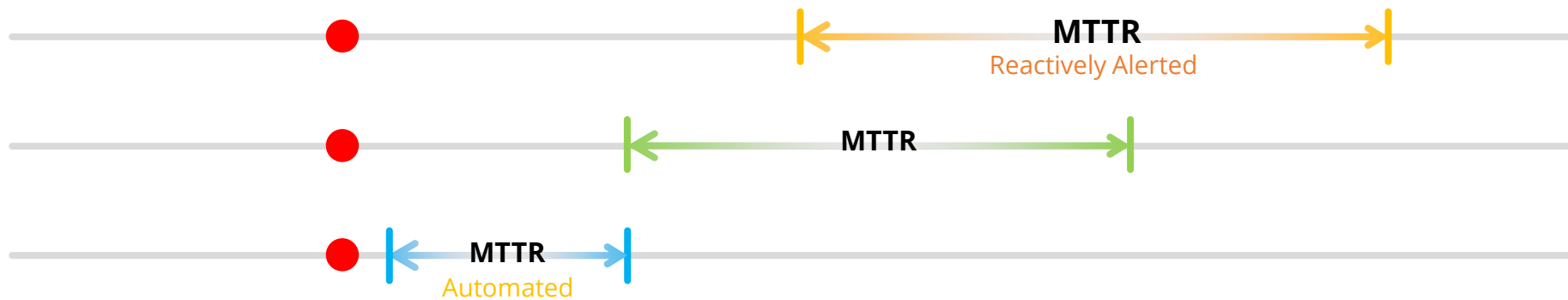
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PRODUCTIVITY

MATURITY OF ANALYTICS CAPABILITIES

RAW
DATA

STORED
DATA

CLEANED
DATA

VISUALIZATION

PREDICTIVE
ANALYTICS

PRESCRIPTIVE
ANALYTICS

AUTONOMOUS
SYSTEMS

WHAT'S NEXT?

Divitel

Continuously improving the profitability and performance of video services for:

OPERATORS & SERVICE PROVIDERS

CONTENT OWNERS

TECHNOLOGY VENDORS

Faster, better and easy!

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QUESTIONS &
ANSWERS

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TV ECOSYSTEM DISRUPTION: A TRANSITION TO A NEW ECOSYSTEM

Niels Baas

Managing Director, NLziet

TV ECOSYSTEM DISRUPTION

Technology removes traditional 'bottlenecks' in het video landscape
diminishing the power of traditional players
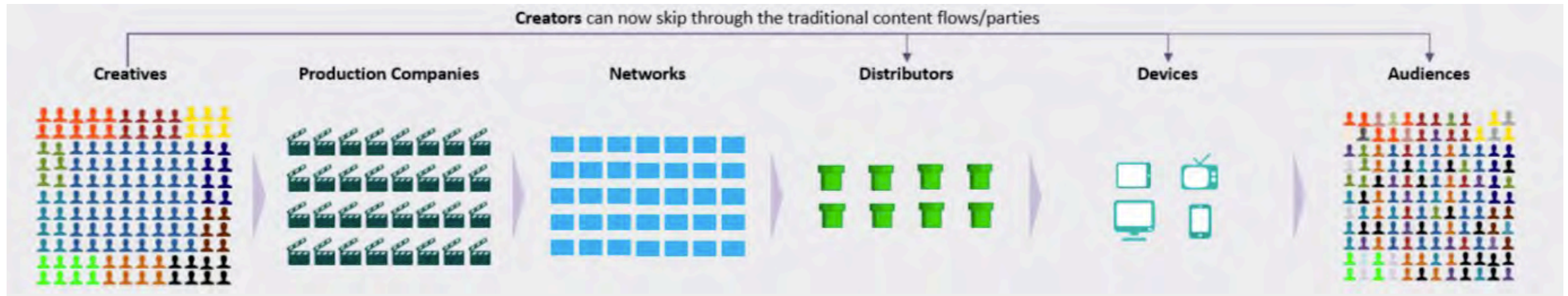
Consumer attention is the new bottleneck!

TRANSITION TO A NEW TV ECOSYSTEM

NLZIET

Content creation	**CURRENT**	**FUTURE**
	Production companies	**Platforms**
Content financing	Broadcasters	
Content offer	Cable/telco tv bundle	
	1 bundle	3-4 subscriptions?
Device/TV/OS platform	Cable/telco Settop box	Android TV, TVOS, Tizen, Fire tv
Connection	Cable/telco managed network	OTT
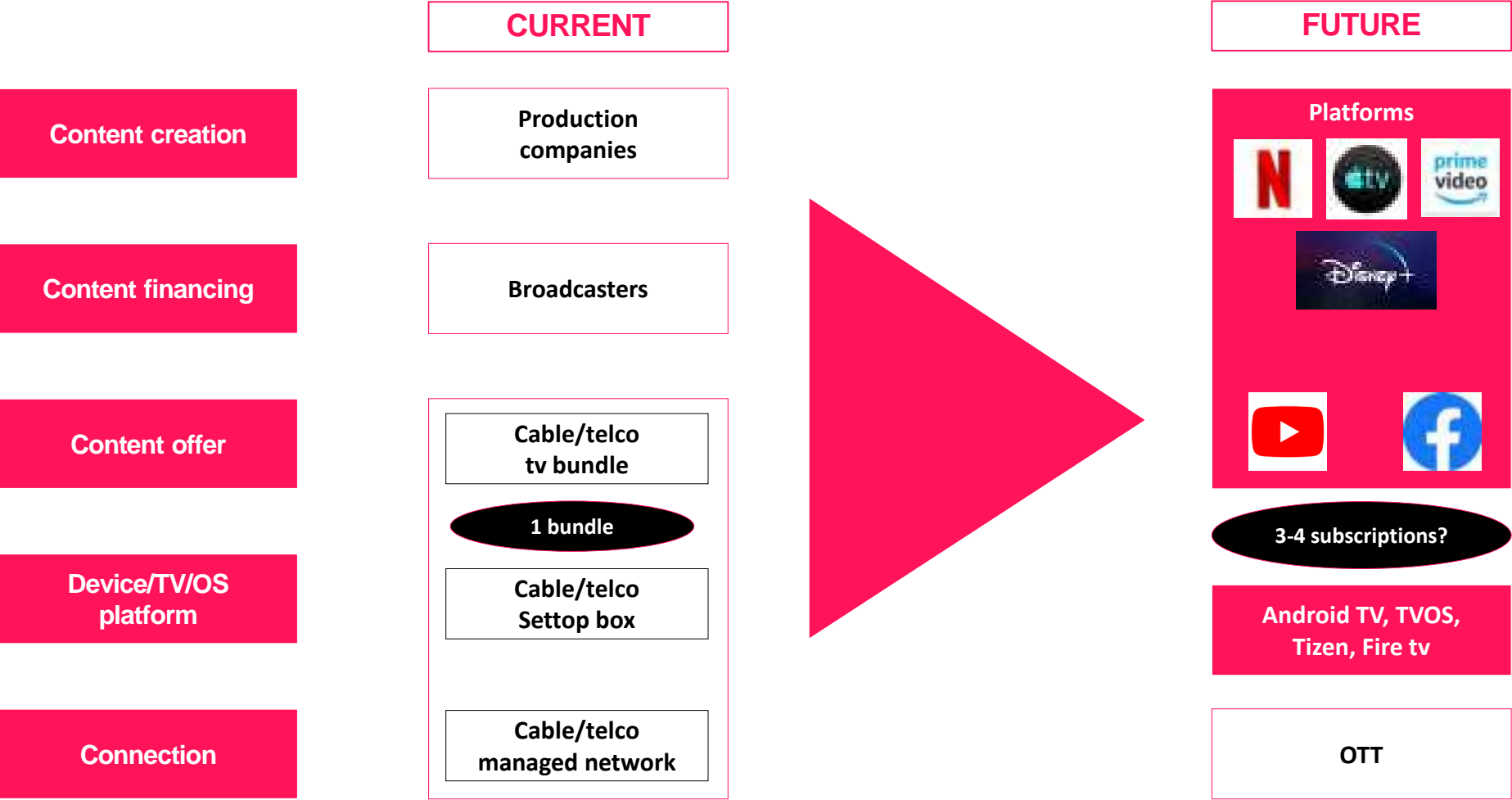
Media landscape

Distribution **Content** **Streaming video** CIRCLES SIZED BY MARKET CAP (as of June 2019)

Warner Bros. Studios
HBO

AT&T/WarnerMedia
$237B market cap
23M video
16M broadband subscribers

Otter Media

Turner (CNN, TNT, TBS)

DirecTV

Hulu
$15B
25M subs

65% STAKE

ESPN

20th Century Fox Studios

Disney/21st Century Fox
$254B

ABC

Lucasfilm

Marvel Studios

35% STAKE

Verizon Media Group (Yahoo/AOL)

Dreamworks

NBC

Netflix
$158B
139M subs

Fox broadcast

Fox
$23B

Fox cable (Fox News, Fox Sports)

Verizon
$237B
5M video
7M broadband

Sky

Comcast
$198B
22M video
27M broadband

Columbia Pictures

Sony Pictures
$35B*

Universal Studios

E!, Bravo, CNBC

Sony Pictures TV

News 12 Networks

i24NEWS

Showtime

CBS
$19B

CBS Interactive/ CNET

Discovery Scripps
$15B

Charter
$90B
17M video
25M broadband

CBS

TO BUY

Discovery, Food Network, HGTV

Altice USA
$16B
3M video
4M broadband

Cheddar

James Bond

Paramount

Cox
$37B**
~4M video
~5M broadband

Epix

MGM
$6B**

AMC
$3.1B

Viacom
$12B

Viacom Media (MTV, Comedy Central, BET)

Lionsgate/ Starz
$2.5B

Starz

Dish
$19B
13M video (includes Sling)

IFC Films

AMC, IFC, BBC America

Lionsgate Films

Lionsgate TV

RELATIVE MARKET CAP
Amazon: $943B
Apple: $920B
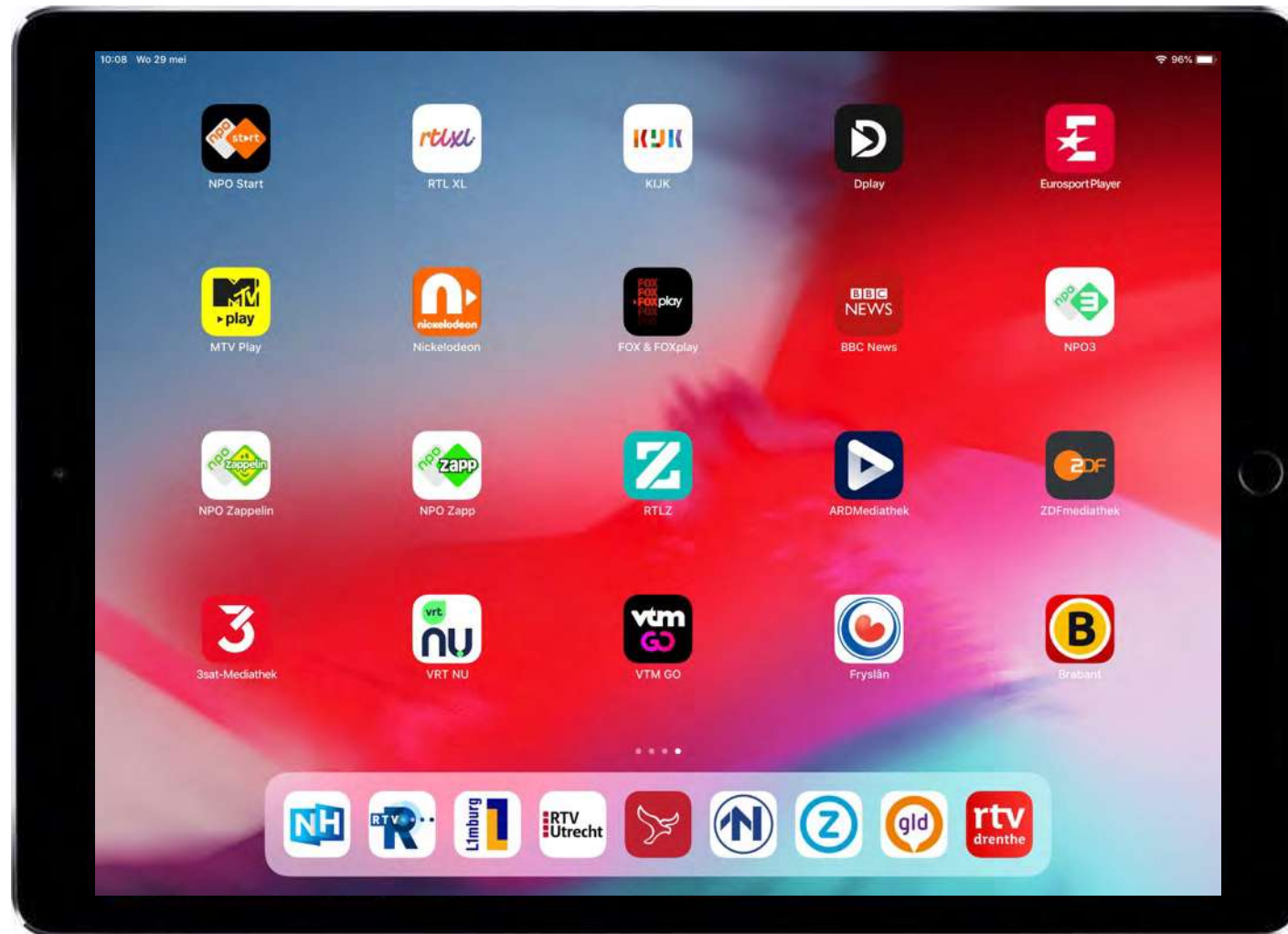Google: $773B
Facebook: $548B

Note: *Assumes 3.8 revenue multiple **Assumes 3.1 revenue multiple
Source: the companies, news reports, Leichtman Research Group (cable/internet subs)
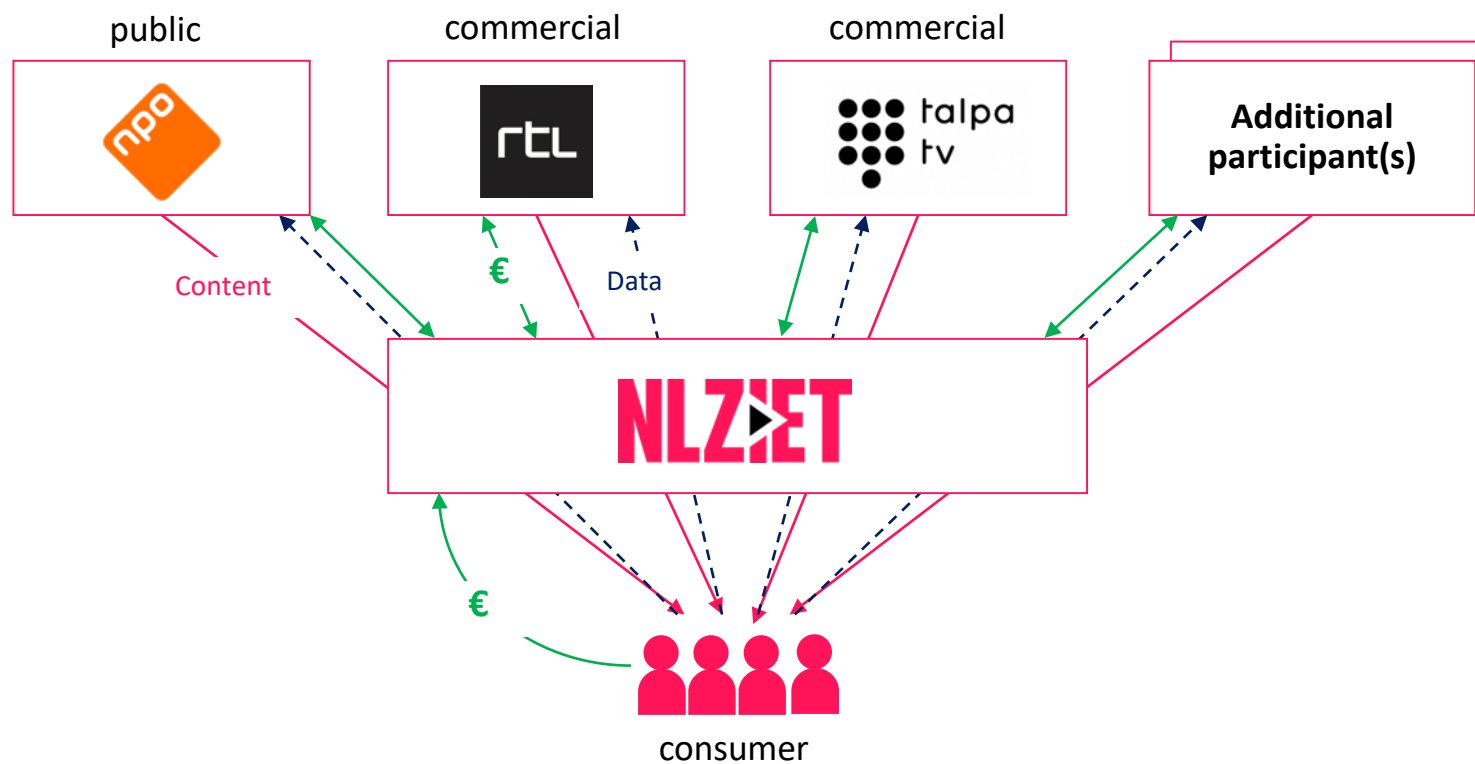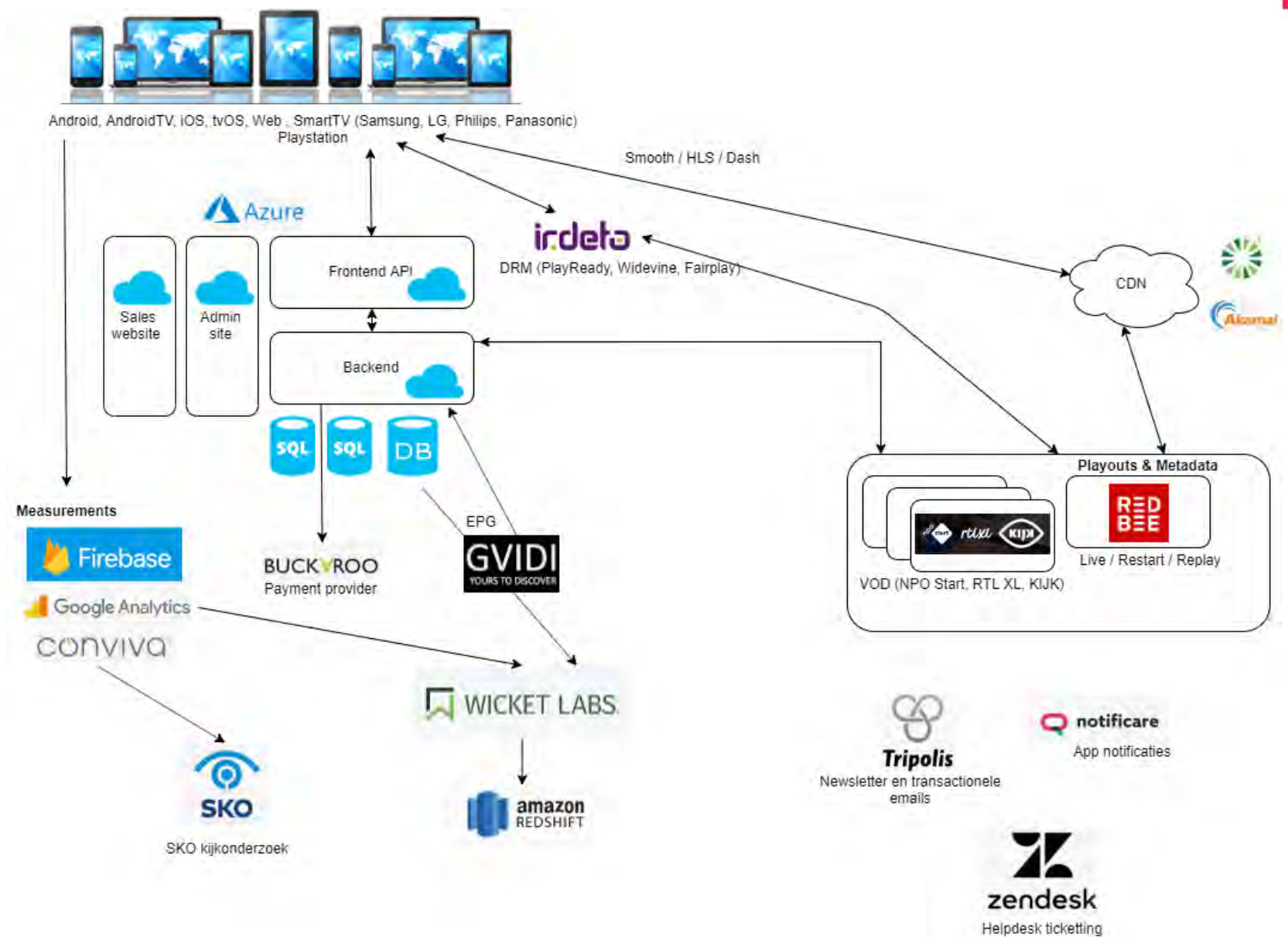
recode

NLZIET

PROBABLY NOT THIS WAY…

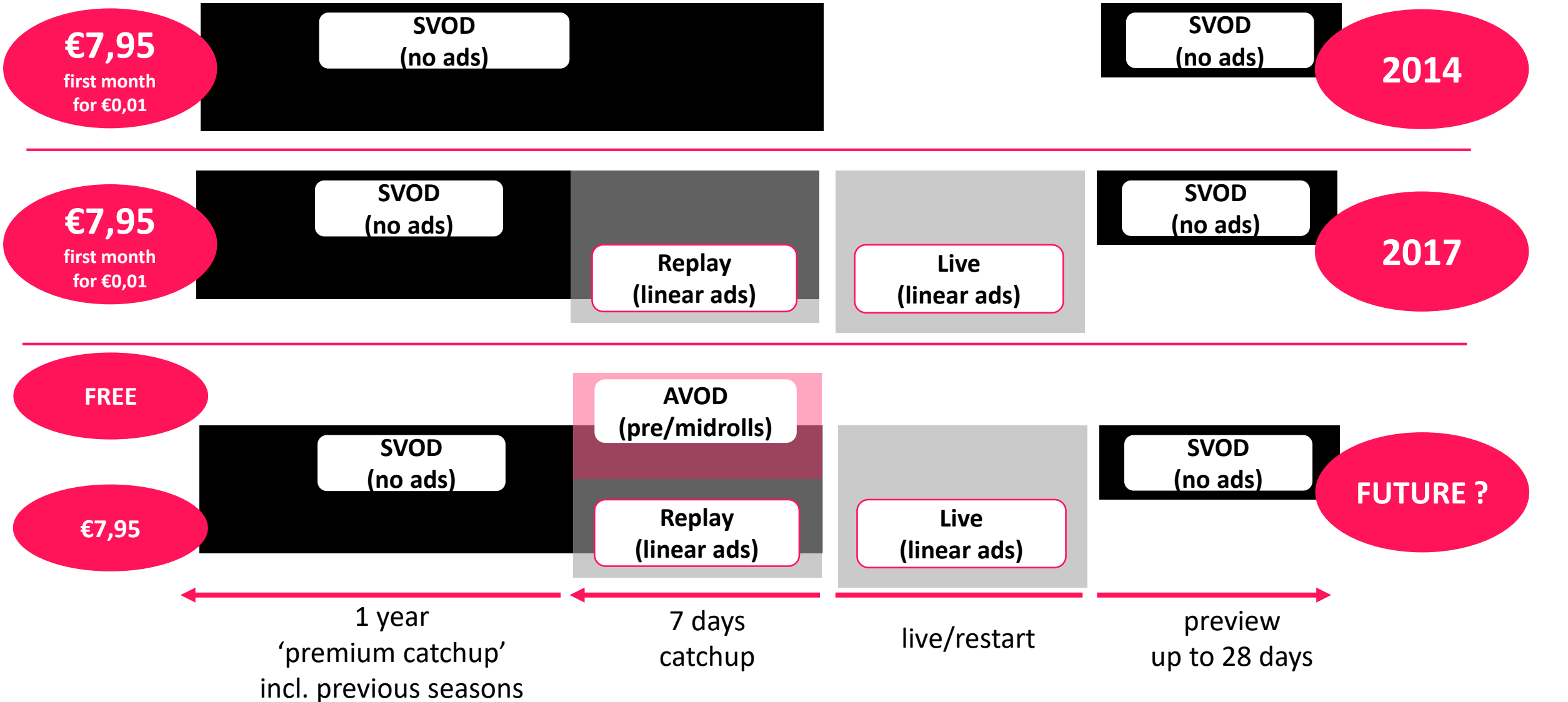**'an app for every tv-channel or broadcaster'**

SETUP

ARCHITECTURE

PROPOSITION DEVELOPMENT

NLZIET

2014

€7,95 first month for €0,01

SVOD (no ads) — SVOD (no ads)

2017

€7,95 first month for €0,01

SVOD (no ads) | Replay (linear ads) | Live (linear ads) | SVOD (no ads)

FUTURE ?

FREE

€7,95

SVOD (no ads) | AVOD (pre/midrolls) / Replay (linear ads) | Live (linear ads) | SVOD (no ads)

1 year 'premium catchup' incl. previous seasons | 7 days catchup | live/restart | preview up to 28 days

all Dutch tv channels in one app

Unlimited access to 'all' Dutch on demand/catchup content

Start programma's waar en wanneer je maar wilt op NPO Start. Met NPO Start Plus kijk je zonder reclame alle afleveringen van je favorieten Nederlandse series.

Ontdek als eerste nieuwe afleveringen voordat deze op TV zijn uitgezonden. En naast alle programma's van RTL kijk je de beste series uit binnen- en buitenland.

Je ziet meer met KIJK. Kies uit het brede aanbod series en programma's. Het KIJK-plezier start waar en wanneer je wilt, met één druk op de knop.
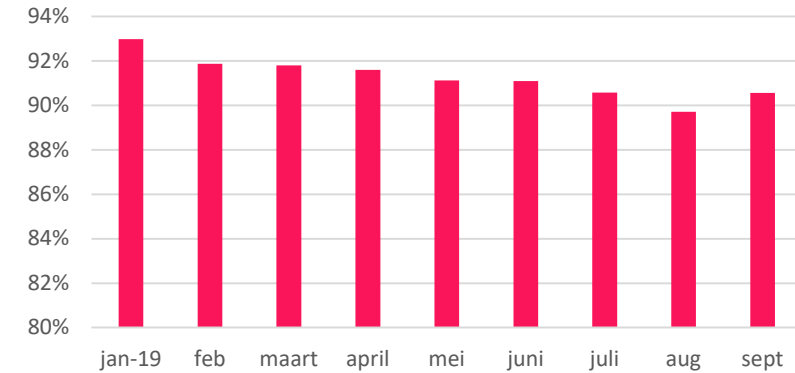
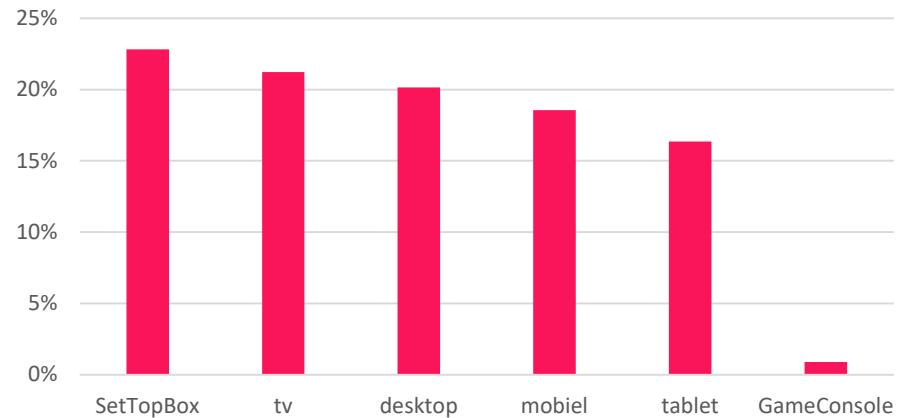# Watch anything, anytime, everywhere

USAGE

NLZIET

- Avg viewing time/day/MAU: > 1hr
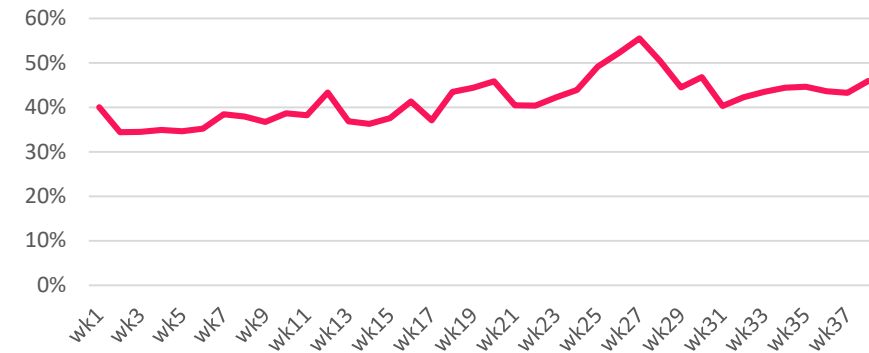- Active base: ca. 85-90%
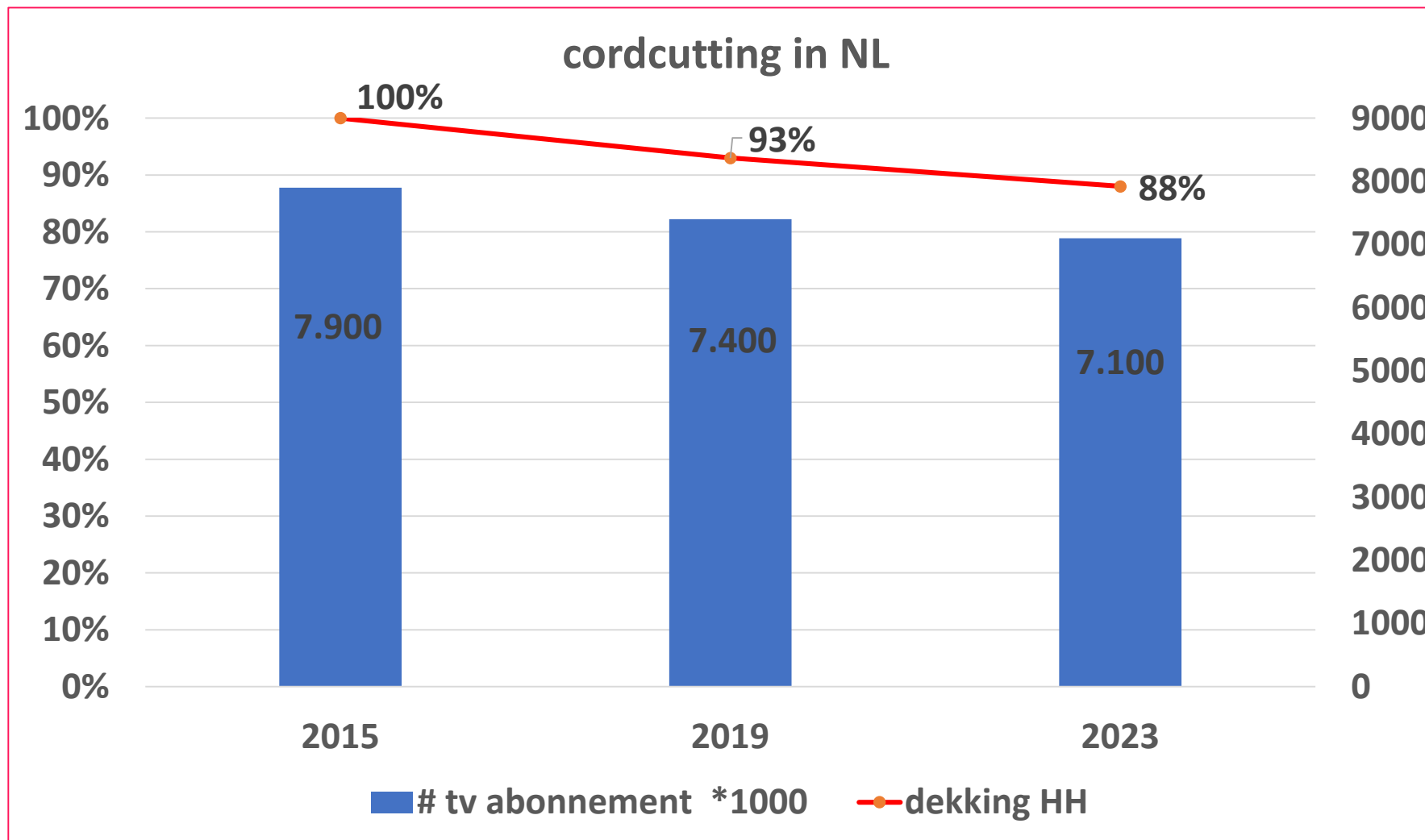- NPS score: 54

USAGE in Dutch territory

Mostly used device

Share live viewing time (+replay+restart) in total

CORDCUTTING IN NL

cordcutting in NL

Legend: # tv abonnement *1000 (blue bars), dekking HH (red line)

Year	# tv abonnement *1000	dekking HH
2015	7.900	100%
2019	7.400	93%
2023	7.100	88%

Bron: Dutch TV Market Report, Q2 2019, Telecompaper

LEARNINGS & TACTICS

BROADCASTER ALLIANCES IN EUROPE

THANK YOU!

QUESTIONS & ANSWERS

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CLOUD TRANSFORMATION USE CASES: LESSONS LEARNED FROM THE FIELD

Niall Duffy

EMEA Partner Segment Lead

Media & Entertainment,

Amazon Web Services

#MCTdivitel

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PANEL DISCUSSION
Moderated by

Anette Schaefer

Industry Analyst, Advisor to Telecom,

Media Companies & Investors,

BIG Picture

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10.30 – 10.40	Opening
10.40 – 11.10	The 4th Industrial Revolution and its impact on the media industry
11.20 – 11.50	AI and how it is transforming media & entertainment
12.00 – 12.30	Putting a data strategy into practice
12.40 – 13.30	Networking lunch & tour of Divitel's Operating Center
13.30 – 14.00	TV ecosystem disruption: a transition to a new ecosystem
14.10 – 14.40	Cloud transformation use cases – lessons learned from the field
14.50 – 15.50	Panel discussion
15.50 – 16.00	**Closing**
16.00 – 17.00	Food and Drinks / Networking

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THANK YOU!

SURVEY

FOOD AND DRINKS

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