

Marketing strategies efficiency enhanced by the design of a Machine Learning insights tool

Aalto SCI3020 - Master thesis presentation

Laura Deleuze

Supervisor: Pr. Marko Nieminen

Introduction



Investments half wasted



Introduction



Investments half wasted



Data explosion



Introduction



Investments half wasted



Data explosion



Existing data modelling



Research Question



How to design a user-friendly Machine Learning-based decision support system delivering understandable insights that marketers act upon?



Outline

Design Situation



Users Context Study



Design Guidelines



Marketers Feedbacks





Design Situation - Research background

Marketing

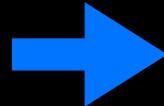
Decision Support Systems

Econometrics modelling

Human Data Interaction



Design Situation - Research background



Marketing

- “*Activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large*” - (AMA, 2017)
- In practice: **Advertising & Branding**
- Long-term and Short-term effect

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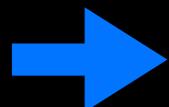


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- **Interactive** computerised system intended **to support decision makers** in the use of information and communication to **identify and solve problems and take decisions** (Power and Sharda, 2009)

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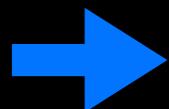
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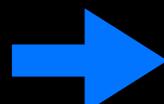
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HDI

- “*The human manipulation, analysis, and sensemaking of large, unstructured, and complex datasets*” - (Elmqvist, 2011)



Design Situation - Research environment

RandI

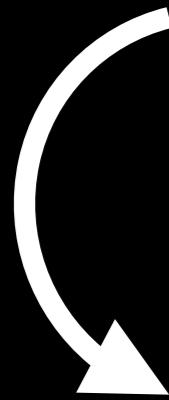
DATA: KPIs, investments & Media channels costs



Randl

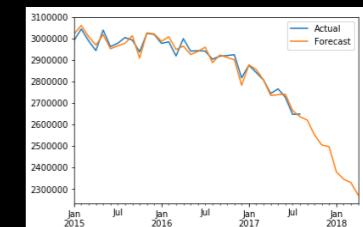
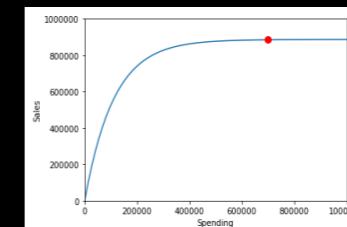
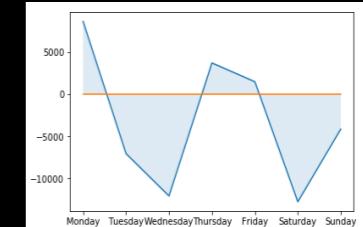
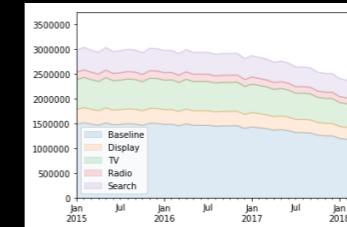
DATA:

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3

- Current Marketing state analysis
- A prediction tool
- A simulation tool



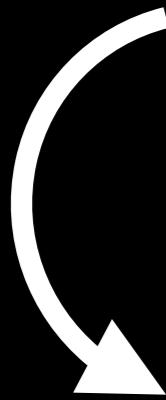


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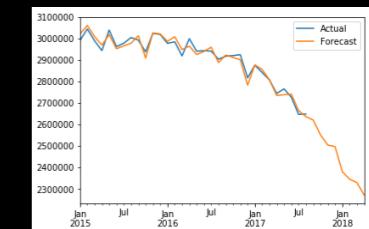
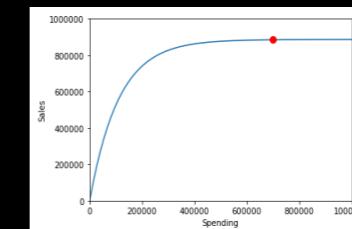
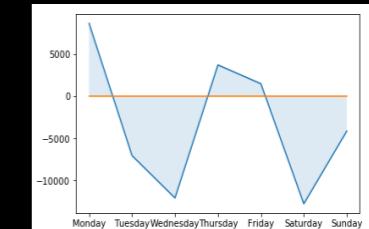
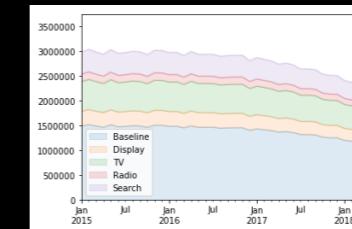
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SOLD Services:

Consultancy, Dashboard & API (including training)

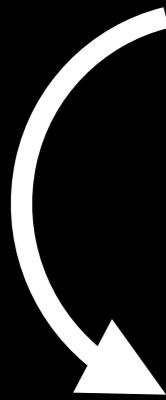


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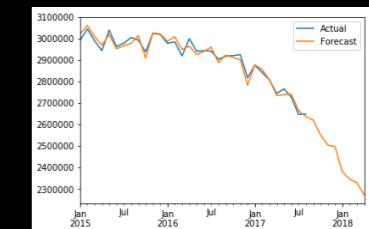
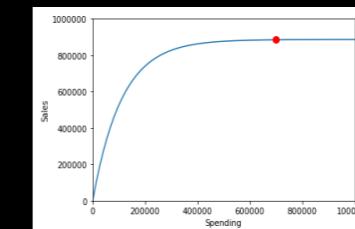
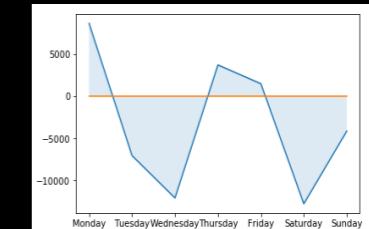
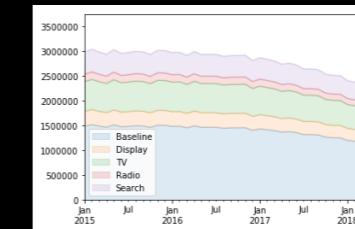
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Long-term modelling



Methodology

Contextual Inquiries as an Inductive Interpretivist Semi-structured approach

- ★ 11 interviewees
- ★ 10 audio recording transcribed
- ★ 2 content analyses:



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- ★ Manifest analysis & 3 company groups
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- ★ Open coding in 2 rounds → Atlas.ti + memos + spreadsheet
- ★ Categorisation



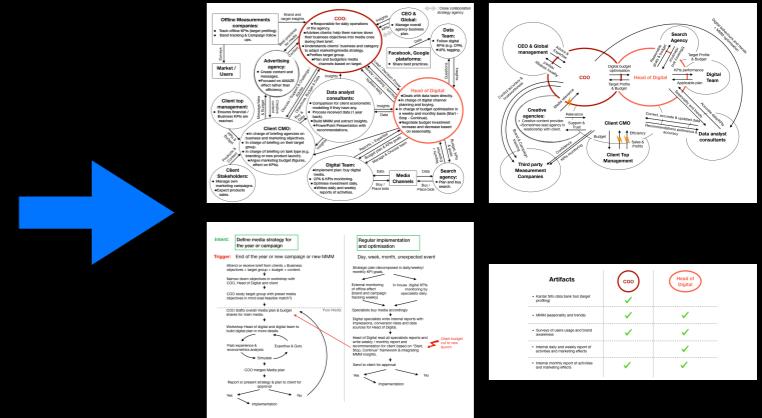
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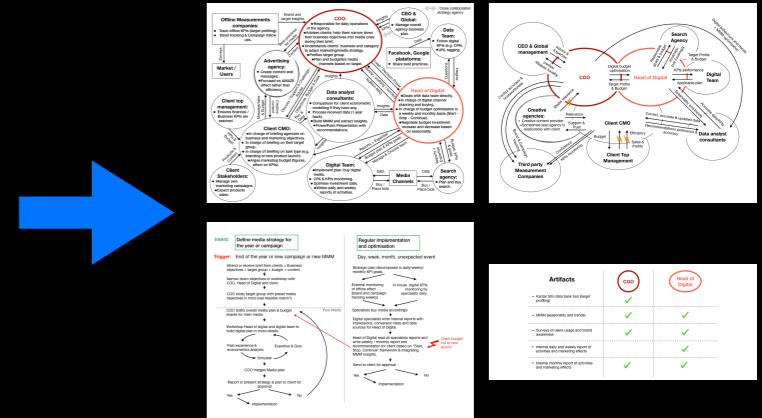
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2nd Content analysis: Why are marketers drawn to use data?

- ★ Latent analysis
- ★ Thematic analysis framework
- ★ Rationale & Attitudes



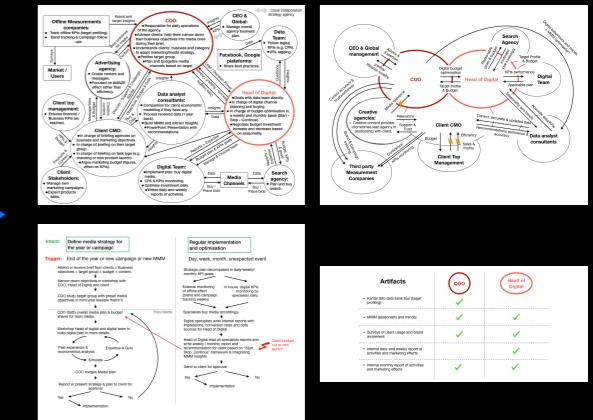
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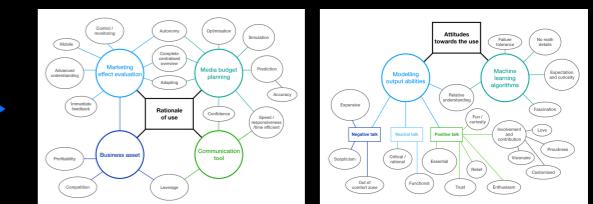
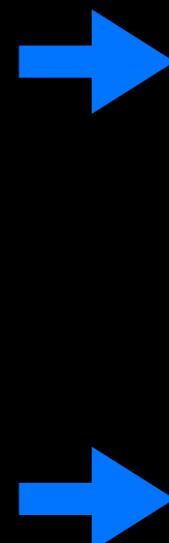
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Preliminary results synthesis

4 Personas based on patterns:

- Gina Anderson: Innovators
- Johan Åkeson: Adopters **with** Media agency
- Sara Martin: Adopter **without** Media agency
- Sven Berg: Media Agency

4 sets of Work-models

Design guidelines



Johan Åkeson

Customer Acquisition Director at Audi
Sverige - 37 years old

A close-up portrait of a man with light brown hair, blue eyes, and a beard. He is wearing a dark blue shirt. The background is a neutral grey.

Johan Åkeson

Customer Acquisition Director at Audi
Sverige - 37 years old

- Married, 1 child: Henry, 5
- Runner in essence
- Food lover: cuisine is an art
- Major Netflix consumer: House of Cards on Business trip
- Evening for family time
- Secured HP laptop from company



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- Untrustworthy forecast
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- Real deep and complete understanding of what happens
- Search separated from other media channels in the regression analysis



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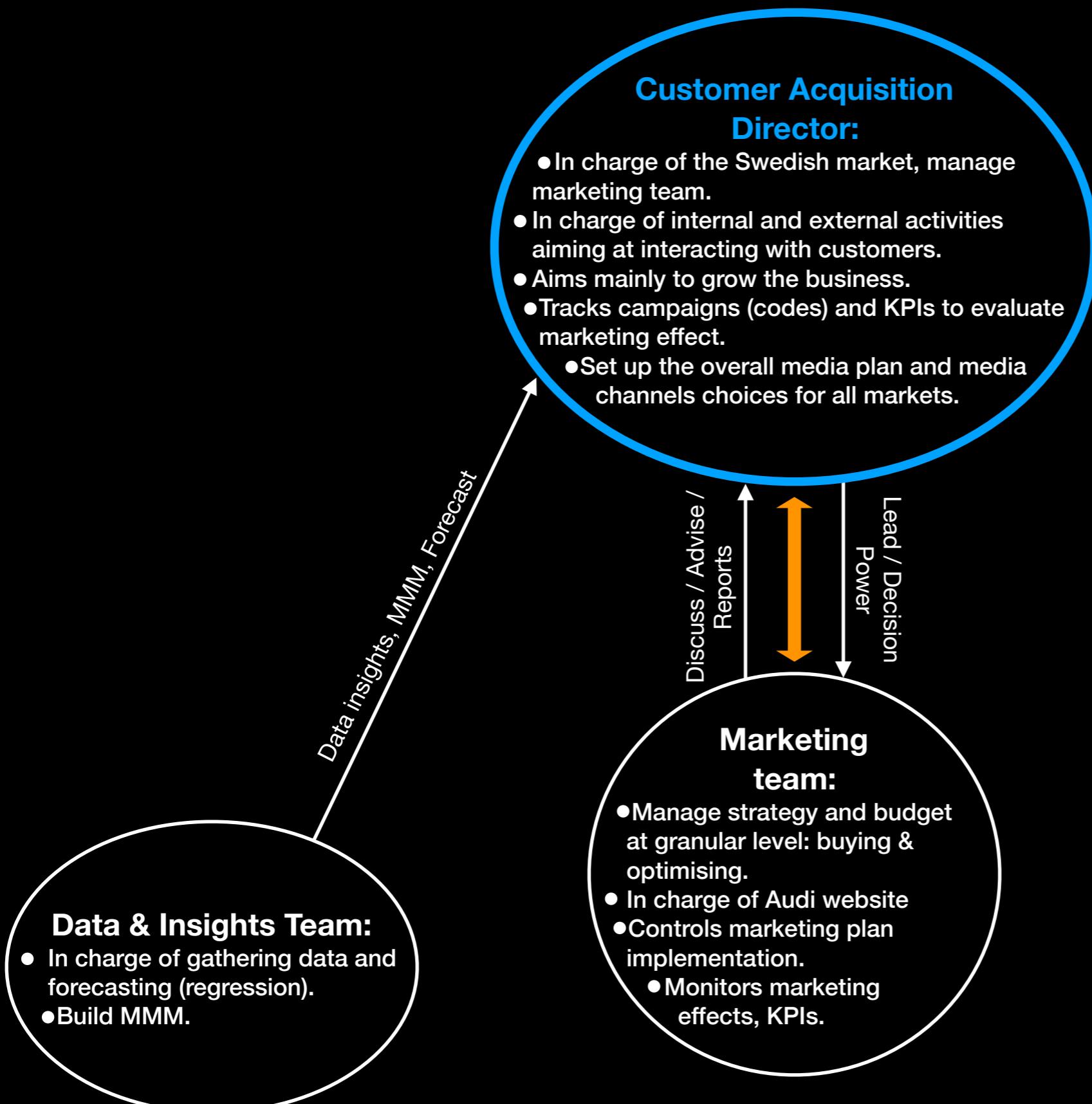
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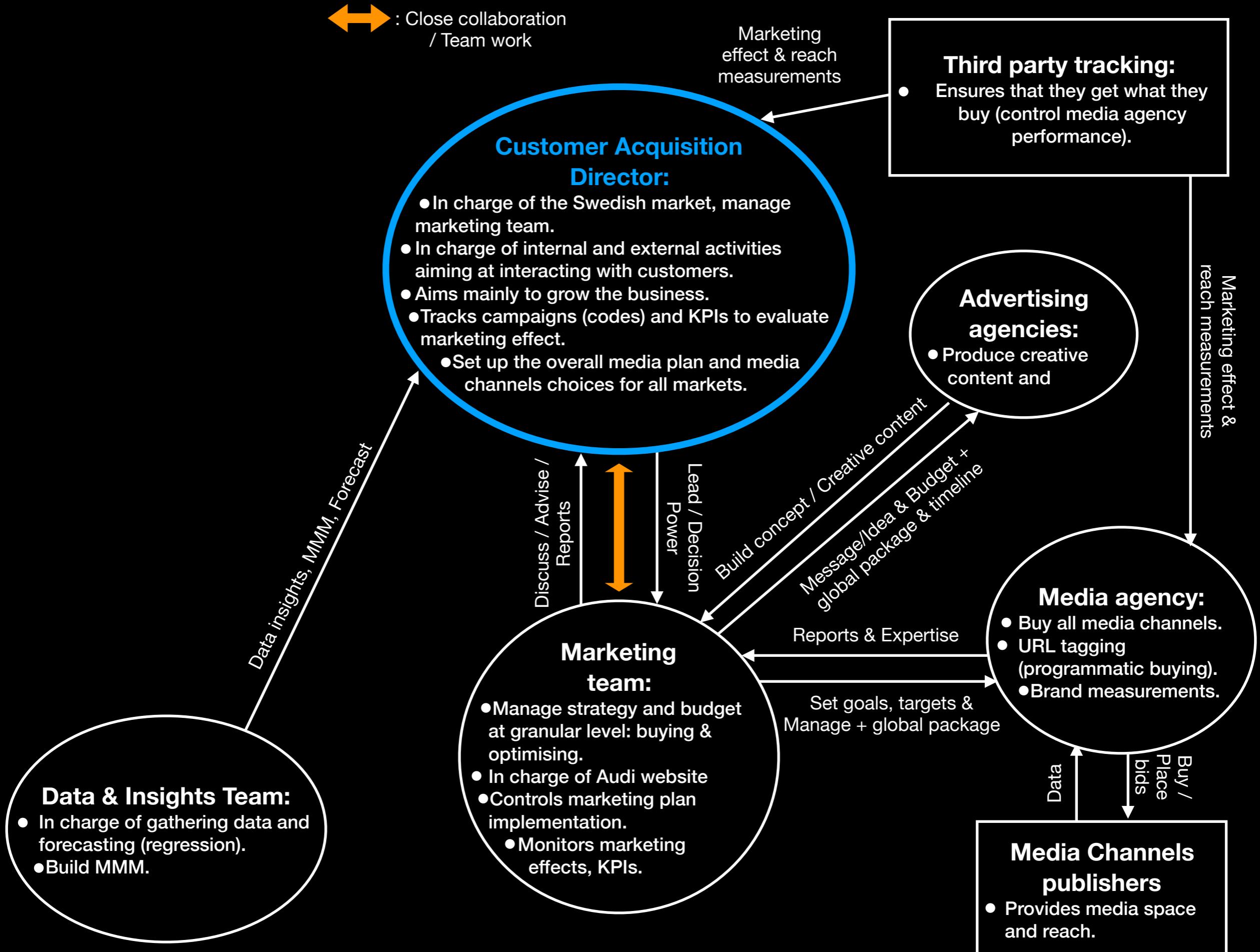
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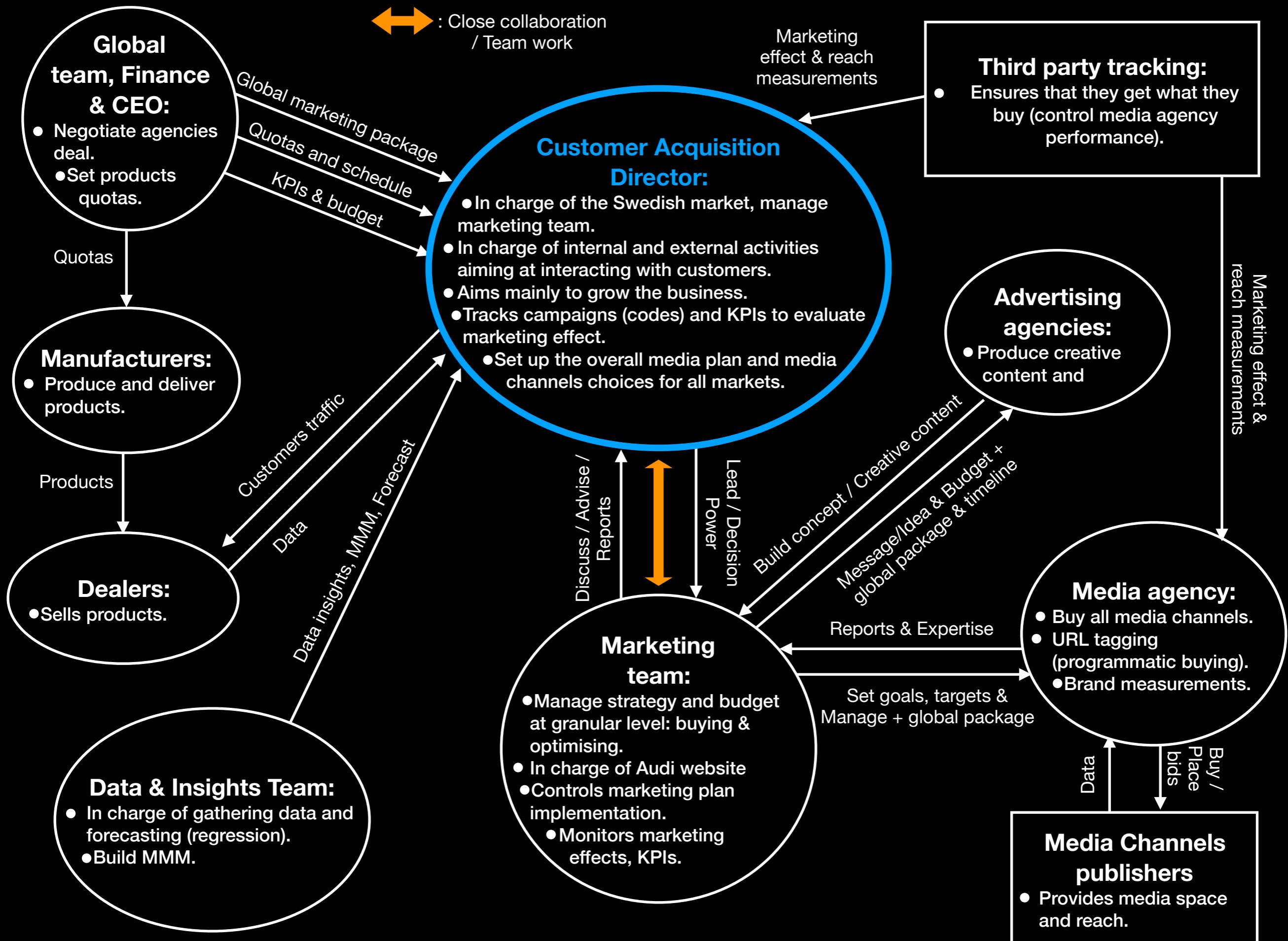
Fears:

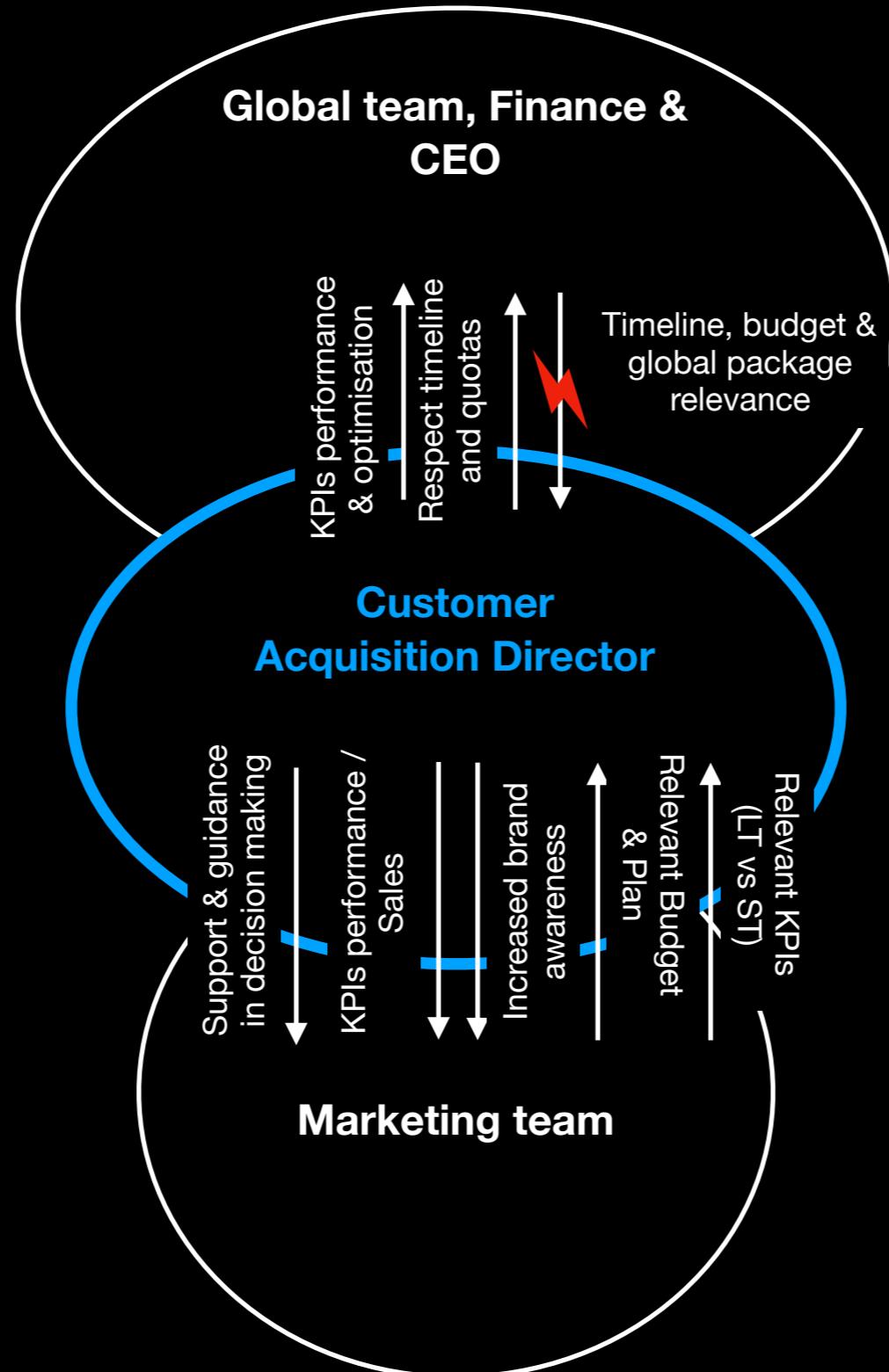
- Wrong conclusion based on irrelevant or incomplete correlation

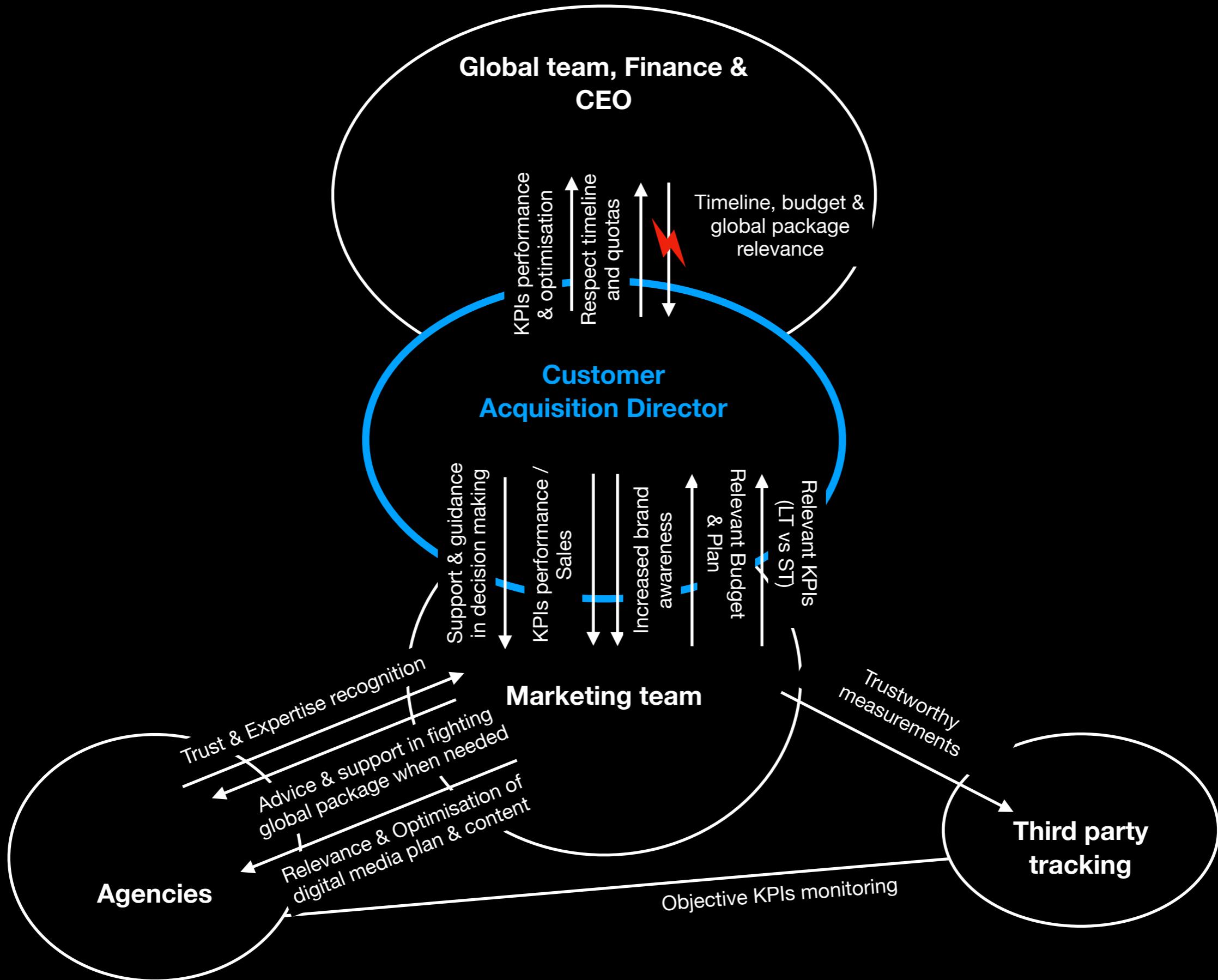
 : Close collaboration / Team work

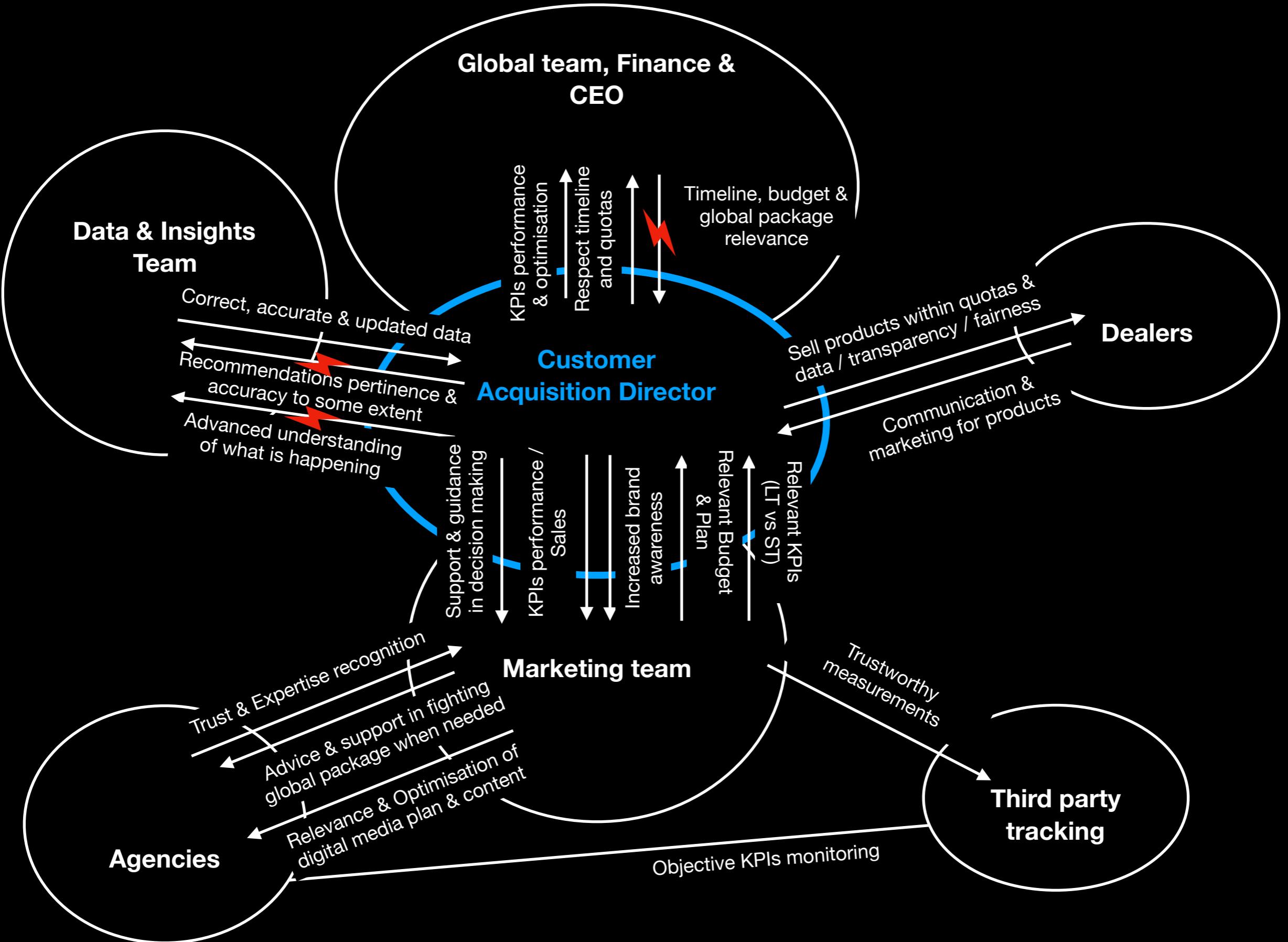












Intent: Define media strategy for the year

Trigger: End of the year or new task or manufacturer timeline

Customer acquisition director receives Global guidelines, package & timeline and transmit to digital and non digital managers to deal with in more details.



Johan looks at what is coming globally and defines scorecards.



Segments markets to talk to right customers (analysis of customers and non-customers)



Analyses and learn from past experience/ campaigns (conversion & traffic per campaigns) & Discuss MMM results.



80% of budget already set from deals and previous years. Leaves 20% to play with.

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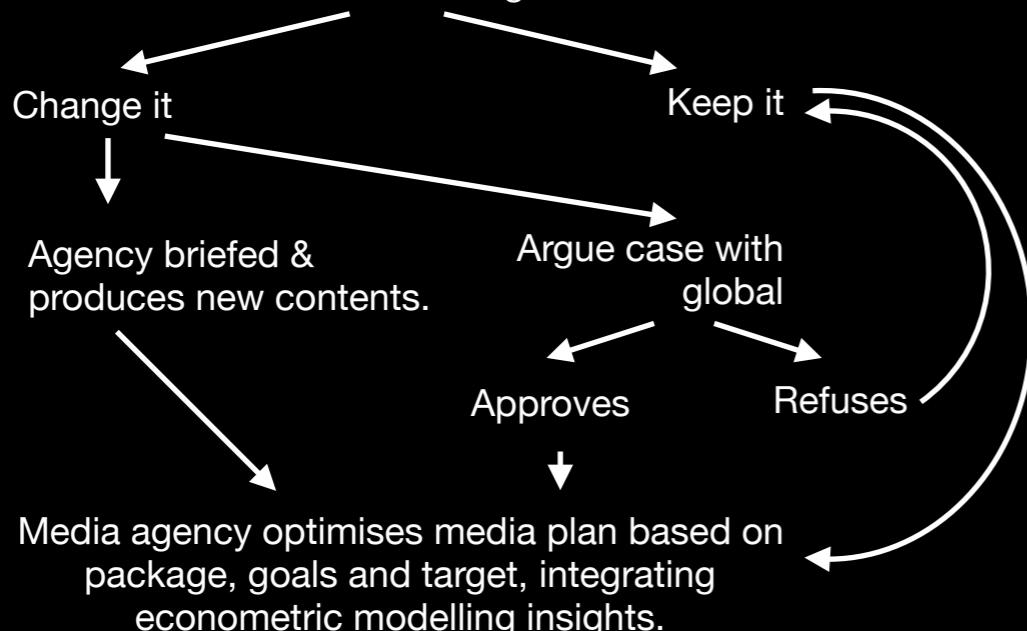
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Global plan and package discussion with internal team and agencies considering timeline and budget.

Keep it

Agency briefed & produces new contents.

Argue case with global

Approves

Refuses

Media agency optimises media plan based on package, goals and target, integrating econometric modelling insights.

Presentation of media plan by media agency.

Refuses Plan

Approves Plan

Media agency implement plan and optimise it on an ongoing basis.

Marketing team tracks KPIs daily. Writes report and adjust course if required.

Marketing team tracks KPIs weekly. Writes report and adjust course if required.

Marketing team tracks KPIs monthly. Writes report and adjust course if required.

Marketing team reports to Johan in monthly meeting with Johan and whole team.

Adjust campaigns, budget and timeline considering quotas as well: which to boost or slow down.

Strange numbers of visits

Contact dealers and media agency to discuss/understand/ solve issue.

Product quotas soon to be reached

Slow or stop campaign. Change to other model.

Artifacts

- Several internal tools for reporting
- Global reports
- Excel sheet with all KPIs figures (e.g., cars sales)
- Customised Adobe Analytics
- Econometric modelling analysis
- Ongoing surveys of users usage and brand awareness
- Conceptual model of LT/ST separation
- Conceptual model of Search: Search not perceived as a real media channel



Design Guidelines

Centralised
Overview

Planning
Tool

Communication
Tool

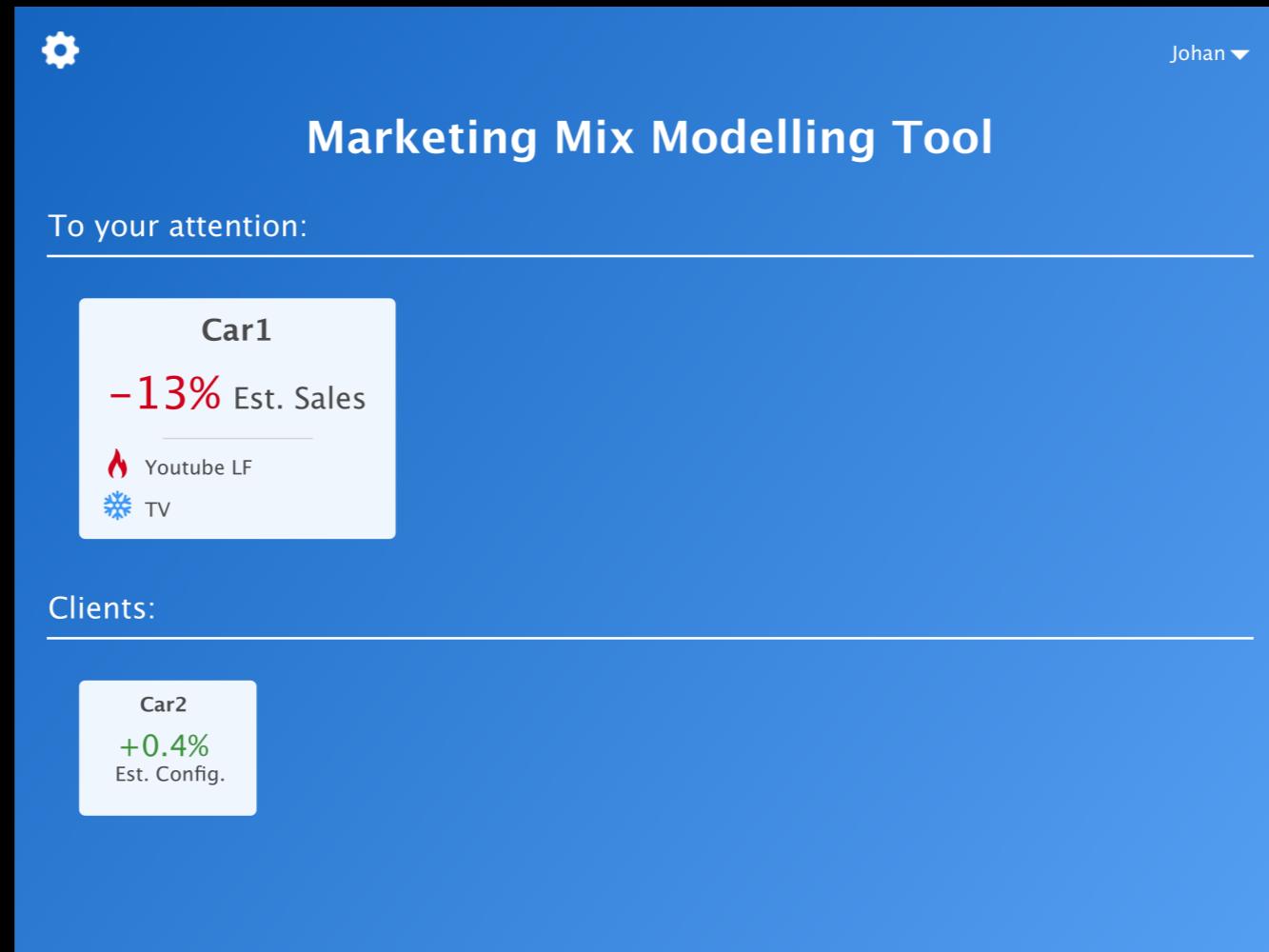


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The image shows a screenshot of a web-based application titled "Marketing Mix Modelling Tool". The interface has a blue header bar with a gear icon and a user profile "Johan ▾". Below the header, there's a section titled "To your attention:" which contains a card for "Car1". The card shows a red "-13% Est. Sales" and two icons: a flame for "Youtube LF" and a snowflake for "TV". Another section titled "Clients:" contains a card for "Car2" showing a green "+0.4% Est. Config.". The overall design is clean with white cards on a blue background.

Marketing Mix Modelling Tool

To your attention:

Car1

-13% Est. Sales

Youtube LF

TV

Clients:

Car2

+0.4%
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MMM Tool

Product: **Car1**

Marketing Health Budget Planning

-13% Est. Sales

Baseline trends as indicator of long-term Marketing effect on Sales

Model Forecast of Sales vs Actual Sales

Incremental Marketing Effect on Sales by media channels

*Based on last model trained on May 29th 2018 at 14:46



Design Guidelines

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MMM Tool

Johan ▾

Product: Car1 ▾

Marketing Health Budget Planning +

< May June, 2018 ▾ July >

Channel	Maximum Sp.	Planned Spend	Estimated Spend*	Estimated Sales*	CPA*	ROI*	Daily Distribution
Google Search		2 679 644	2 679 644	2 100 018	536	15,3	
DBM Display	170 000	152 741	152 741	82 852	254	26,5	
Facebook Video	20 000	11 067	11 067	45 802	125	1,03	
Youtube Video	70 000	8 632	8 632	58 726	6800	8,2	
TV		1 280 341	1 280 341	1 280 341	36	0,39	
Radio		268 722	298 788	298 788	245	1,24	
Total	6 126 573	6 158 615	5 577 034		538	1,59	
Long-term goals	11 114 161		10 708 355				

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Communication
Tool



Design Guidelines

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Product: Car1 -

Marketing Health

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TV							
Radio							
Total							
Long-term goals							

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Budget Planning

< May June, 2018 ▾ July >

Marketing Health

Budget Planning

Youtube Channel Responsiveness

The chart illustrates the relationship between the spend and the effect for the paid media. The dots represent current media spend level and the steeper line, the higher efficiency.

Planned Spend: 131 088

Estimated Sales*: 36 068

*Based on last model trained on May 9th 2018 at 14:46

Communication Tool

Communication

Tool

Planning

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Centralised

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Design Guidelines

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Product: Car1 -

Marketing Health		Budget Planning		
< May		Youtube – June, 2018		July >
Day	Sales	Day	Sales	
Monday	107 646	Tuesday	107 646	
Tuesday	107 646	Wednesday	107 646	
Wednesday	107 646	Thursday	107 646	
Thursday	107 646	Friday	107 646	
Friday	107 646	Saturday	204 646	
Saturday	204 646	Sunday	0	
Sunday	0			

Total: 1 331 088 Total Sales: 931 788

Multiply all values by 100 %

*Based on last model trained on May 29th 2018 at 14:46



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Marketing Mix Modelling Tool

To your attention:

- Car1**
-13% Est. Sales
Youtube LF, TV
- Car2**
+0.4% Est. Config.

Clients:

Product: Car1

Marketing Health

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TV	1 280 341	1 280 341	1 280 341	36	0,39		
Radio	268 722	298 788	298 788	245	1,24		
Total	6 126 573	6 158 615	5 577 034	538	1,59		
Long-term goals	11 114 161	10 708 355					

*Based on last model trained on May 29th 2018 at 14:46

Product: Car1

Marketing Health

Budget Planning

Youtube Channel Responsiveness

The chart illustrates the relationship between the spend and the effect for the paid media. The dots represent current media spend level and the steeper line, the higher efficiency.

Channel	Planned Spend	Estimated Sales*
Youtube Video	131 088	36 068
Total		

*Based on last model trained on May 9th 2018 at 14:46

Product: Car1

Marketing Health

Budget Planning

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
107 646	107 646	107 646	107 646	107 646	204 646	0	0
107 646	107 646	107 646	107 646	107 646	107 646	0	11
107 646	107 646	107 646	107 646	107 646	107 646	0	20
107 646	107 646	107 646	107 646	107 646	107 646	0	27
107 646	107 646	107 646	107 646	107 646	107 646	0	0
107 888	107 646	10 646	20 358	100 000	145 646	0	0

Total: 1 331 088 Total Sales: 931 788

Multiply all values by 100 %

*Based on last model trained on May 29th 2018 at 14:46

Communication Tool



Design Guidelines

Centralised Overview

Marketing Mix Modelling Tool

To your attention:

- Car1**
-13% Est. Sales
Youtube LF, TV
- Car2**
+0.4% Est. Config.

Clients:

Product: Car1

Marketing Health

-13% Est. Sales

Baseline trends as indicator of long-term Marketing effect on Sales

Budget Planning

Model Forecast of Sales vs Actual Sales

Incremental Marketing Effect on Sales by media channels

*Based on last model trained on May 29th 2018 at 14:46

Planning Tool

Product: Car1

Budget Planning

Channel	Maximum Sp.	Planned Spend	Estimated Spend*	Estimated Sales*	CPA*	ROI*	Daily Distribution
Google Search	2 679 644	2 679 644	2 100 018	536	15,3		
DM Display	170 000	152 741	152 741	82 852	254	26,5	
Facebook Video	20 000	11 067	11 067	45 802	125	1,03	
Youtube Video	70 000	8 632	8 632	58 726	6800	8,2	
TV	1 280 341	1 280 341	1 280 341	36	0,39		
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Total		

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Product: Car1

Budget Planning

Youtube – June, 2018

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1	107 646	107 646	107 646	107 646	107 646	204 646	0
2	107 646	107 646	107 646	107 646	107 646	107 646	11
3	107 646	107 646	107 646	107 646	107 646	107 646	0
4	107 646	107 646	107 646	107 646	107 646	107 646	20
5	107 646	107 646	107 646	107 646	107 646	107 646	0
6	107 646	107 646	107 646	107 646	107 646	107 646	27
7	107 888	107 646	10 646	20 358	100 000	145 646	0

Total: 1 331 088 Total Sales: 931 788

Multiply all values by 100 %

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Communication Tool





Validations interviews

- ★ 9 validated interviewees
- ★ 8 audio recordings
- ★ 2 phases:



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- ★ Addition of new insights
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- ★ Real use potential
- ★ Easy to use, play with it
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- ★ Planning tool appreciation, new vocabulary + optimisation



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- ★ 1 “*Not my decision*”
- ★ Obvious sharing functions
- ★ Connection with brand tracking data
- ★ Introduce special notes + tactical constraints on budget optimisation

Conclusion

To design a ML-based DSS:

Conclusion

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Conclusion

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To design a ML-based DSS:



- Personas
- Work-models



Conclusion

To design a ML-based DSS:



- Personas
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- Intuitive & interactive design
- Personalised
- Organised around three tasks:
 1. Centralised Overview
 2. Budget Planning
 3. Communication



Conclusion

To design a ML-based DSS:



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- Accurate & functional data-driven insights
- Real-time data & frequent model updates
- Business relevance

Conclusion

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- Personas
- Work-models



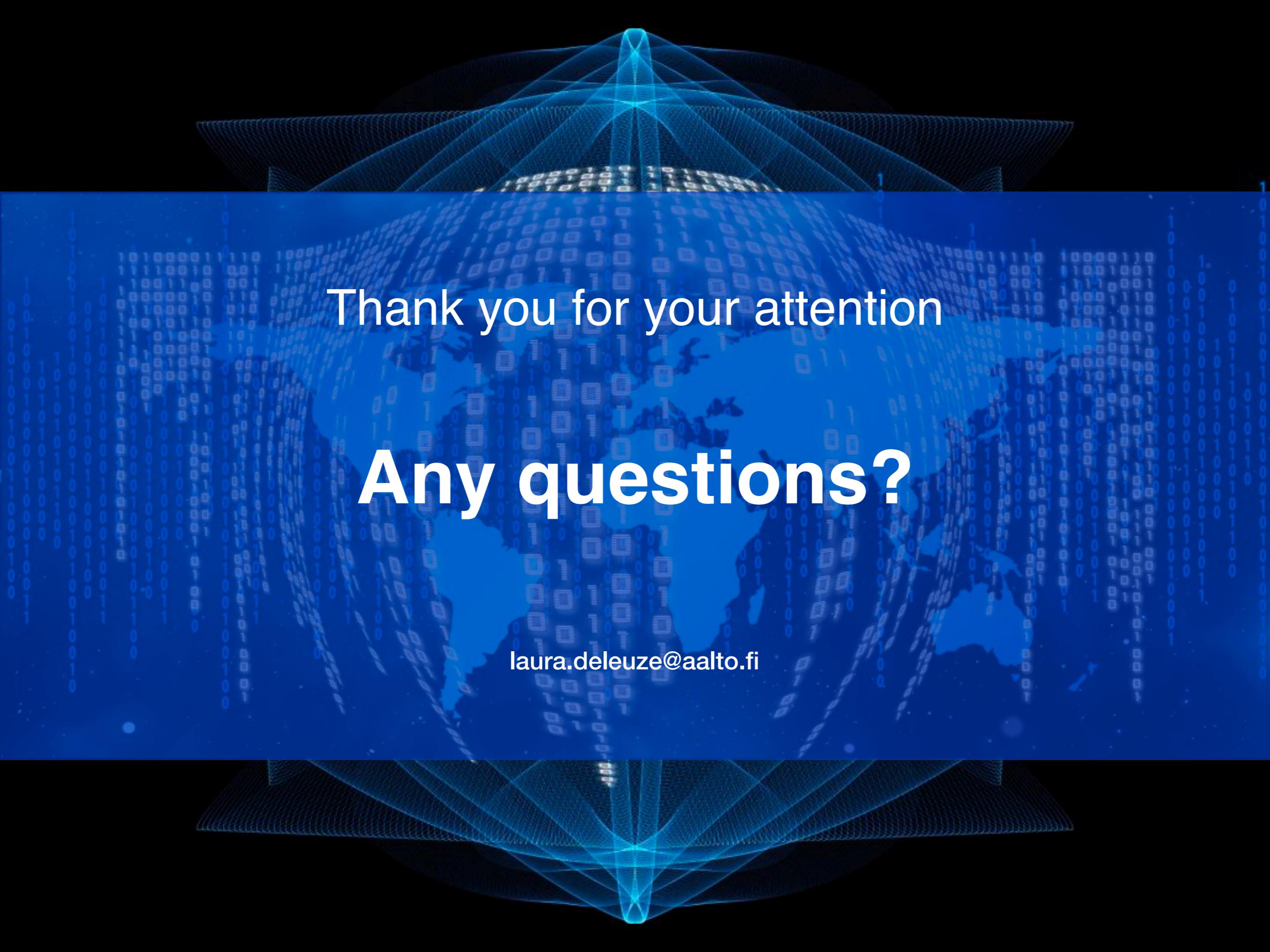
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- Accurate & functional data-driven insights
- Real-time data & frequent model updates
- Business relevance



- ★ Marketer confidence
- ★ Marketing control
- ★ Business assets



Thank you for your attention

Any questions?

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References

American Marketing Association (2017). Definition of Marketing. [Online]. Available at: <https://www.ama.org/AboutAMA/Pages/Definition-of-Marketing.aspx> (Accessed: 25 June 2018).

Business Dicitonary (2018). Definition of Econometric modelling. [Online]. Available at: <http://www.businessdictionary.com/definition/econometric-modeling.html> (Accessed: 25 June 2018).

Elmqvist, N. (2011). Embodied human-data interaction. In ACM CHI 2011Workshop Embodied Interaction: Theory and Practice in HCI, pages 104–107.

Power, D. J. and Sharda, R. (2009). Decision Support Systems, pages 1539–1548. Springer Berlin Heidelberg, Berlin, Heidelberg.