TRIZ CASES

June, 2019

ANDREI KURYAN

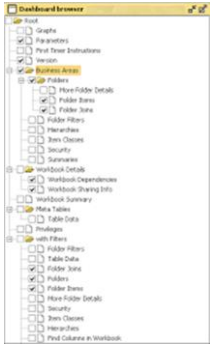
1. 3D Browser
2. Credit Council
3. IoT Design Process
4. IHG personalization engine
5. Edmunds personal assistant (A. Siarheeva, S. Boika, D. Ogievich)
6. EPAM Staffing process (+ D. Falkov)
7. EPAM Experience Acquisition (+ S. Boika)
8. EPAM CDP (L&D) Training Service (+ V. Kasabutskaya, Irina Kureichyk)

TRIZ Case Study #1

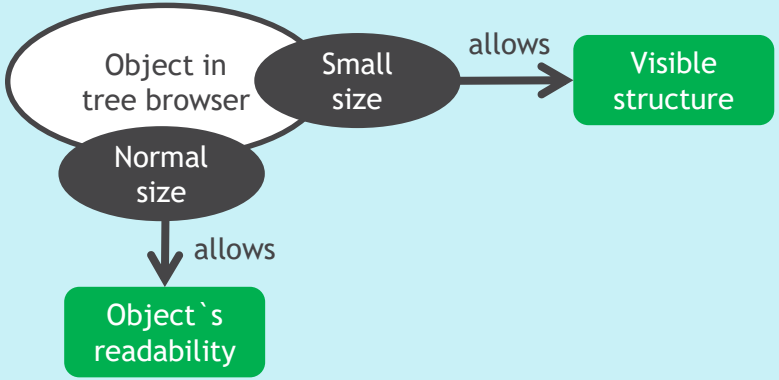
3D BROWSER

1. Problem Statement. The application allows to connect to data source and display data in the browser. The problem was that browser cannot adequately represent the huge amount of data.
2. Approach. We detected the key contradiction then by the algorithm of inventive problem solving (ARIZ-85C) we analyzed it and generated an idea of the solution.
3. Results. Based on the generated idea we designed and implemented 3D browser for huge amount of data.

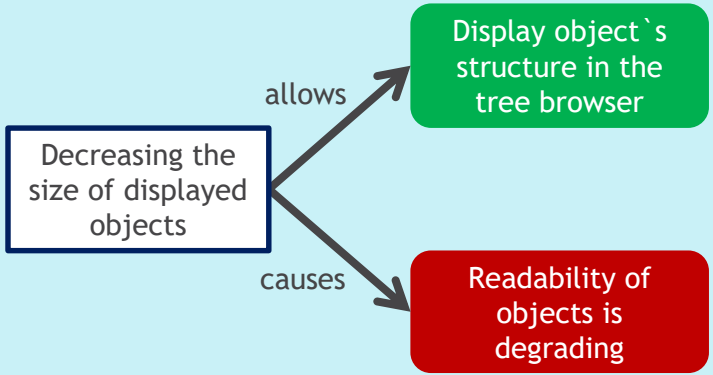
INVENTIVE PROBLEM AS A CONTRADICTION AND IDEAL FINAL RESULT



We can use tree browser to display the hierarchy of objects. When the number of objects is large then we can decrease the size of objects in the browser to display the structure. But in this case the readability is degrading.



Contradiction in requirements



Contradiction in property

Contradiction: object in tree browser must have small size to save visibility of the structure and object must have normal size to save readability of the object

Ideal Final Result: solution must change size of object to save visibility of the structure and readability of the object in tree browser

CONTRADICTION ELIMINATION

TRIZ principle #17. Another dimension

- Use other dimensions, in addition to the already used ones, in your system or process.

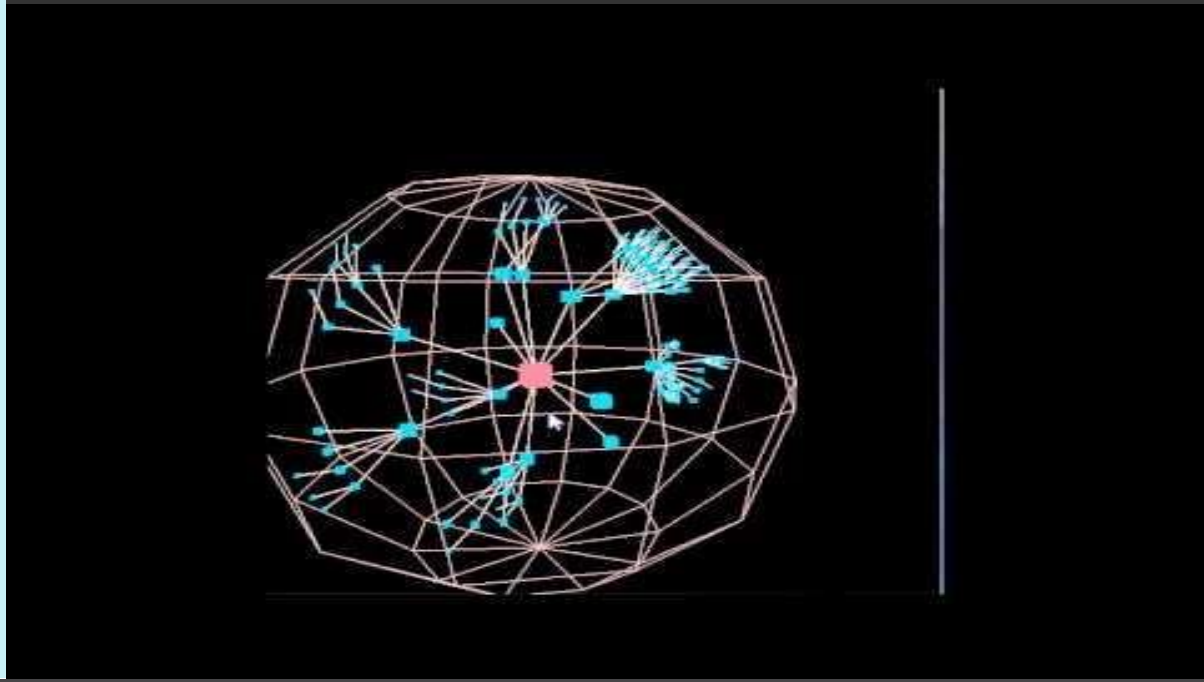
TRIZ principle #4. Assymmetry

- If your system has an symmetrical structure or shape, consider making it asymmetrical.
- If your system is asymmetrical, increase the degree of asymmetry.
- Change the degree of asymmetry by varying the asymmetry dynamically depending on the operating conditions.

TRIZ principle #15. Dynamization

- If your system is static and immobile, make it dynamic and movable.
- Divide your system into the parts capable of moving relatively to each other.
- Increase the degree of free motion within your system.

Solution: 3D hyperbolic tree browser



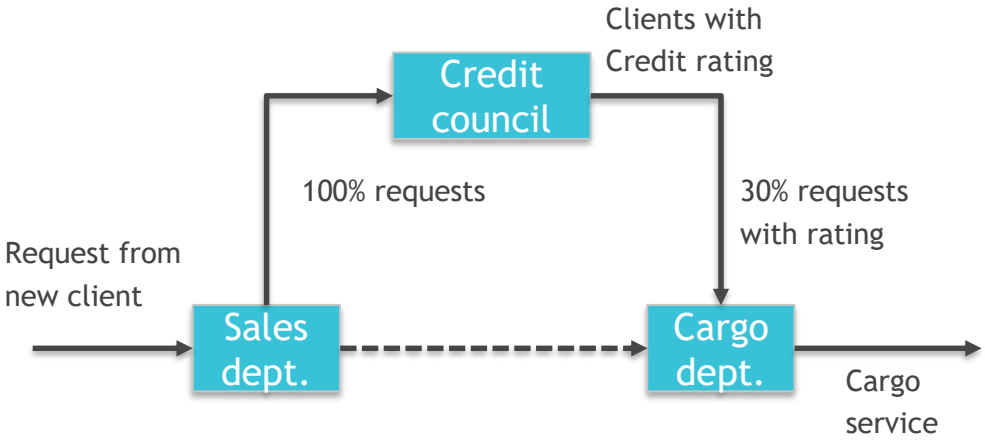
TRIZ Case Study #2

CREDIT COUNCIL

#2 legend

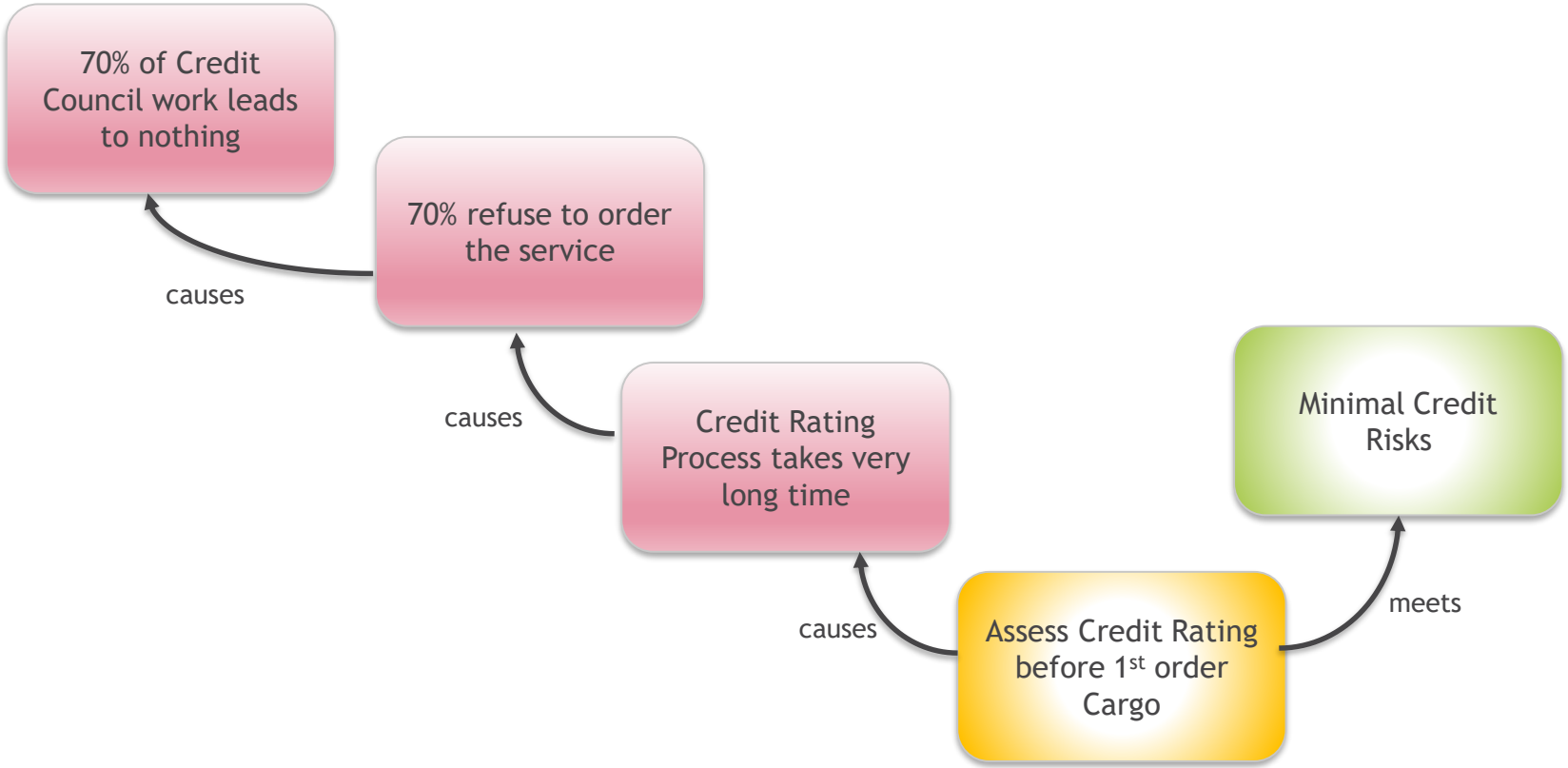
1. Problem Statement. See on the next slide
2. Approach. By RCA+ analysis we detected the contradiction then by the algorithm of inventive problem solving (ARIZ-85C) we detected the key contradiction, identify the ideal final result, and generated an idea of the solution
3. Results. Based on the generated idea we modified the business process and provided that 100% of New Client requests to the Credit Council lead to cargo service.

Situation

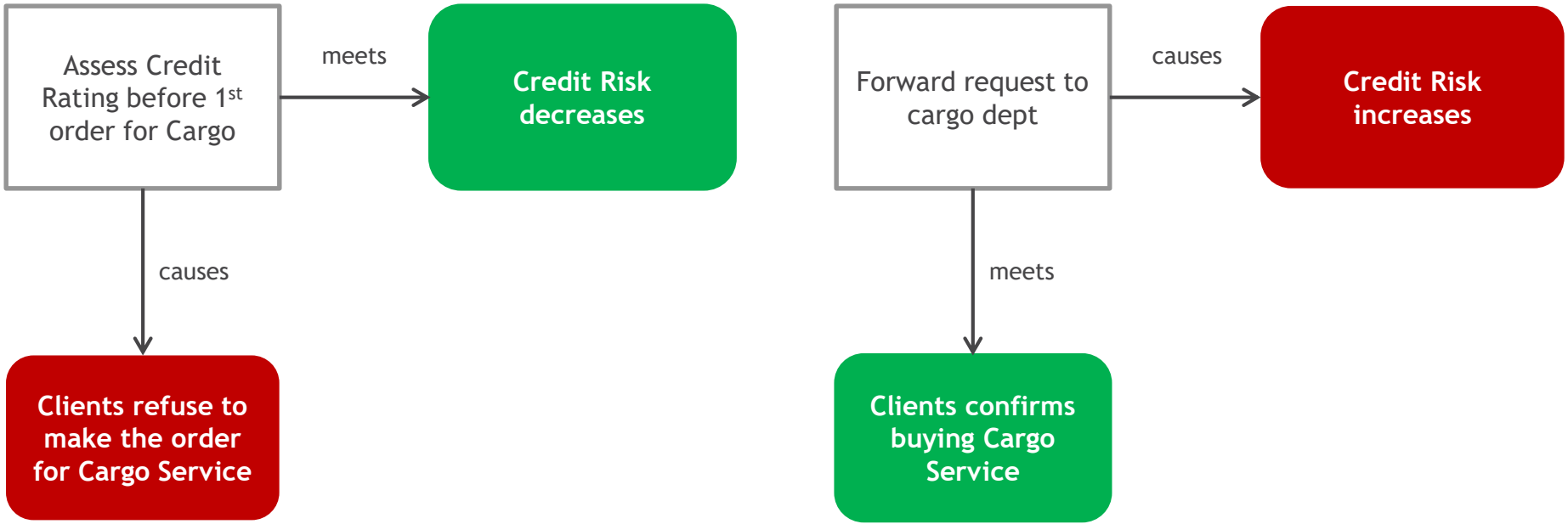


Sales Department of Logistical company working with providing service of goods shipping attracts new customers. Given the fact that shipping services are provided with deferred payment, customer engagement procedure involves a preliminary assessment of the creditworthiness of the client and makes approval of client credibility by Credit Council. However, only 30% of requests from Sales followed by first order from the Client, respectively, 70% of the Credit Council work leads to nothing." What to do in such situation?

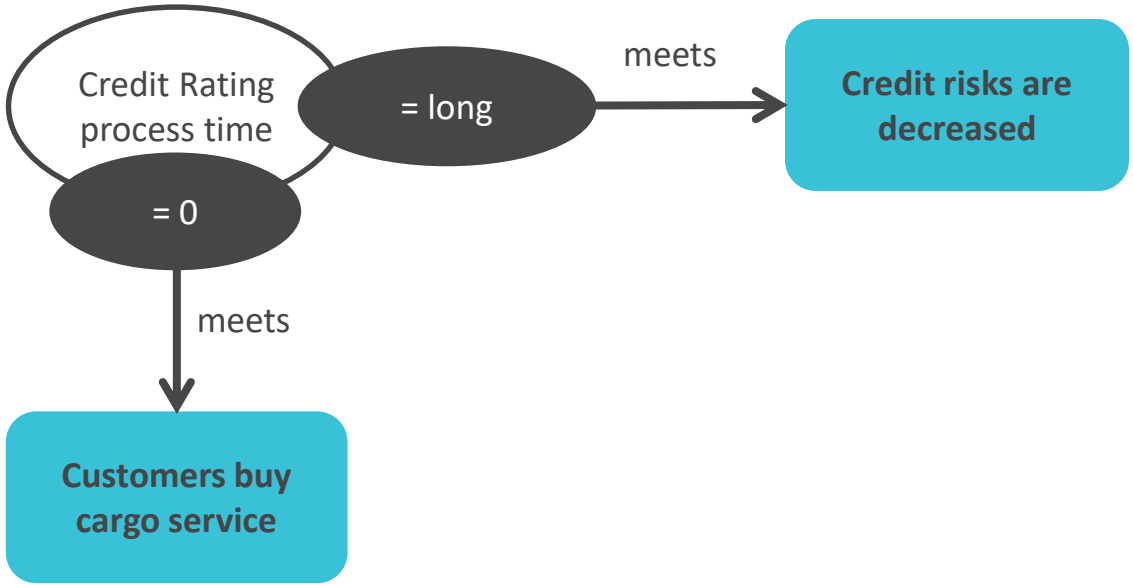
Root-conflict analysis +



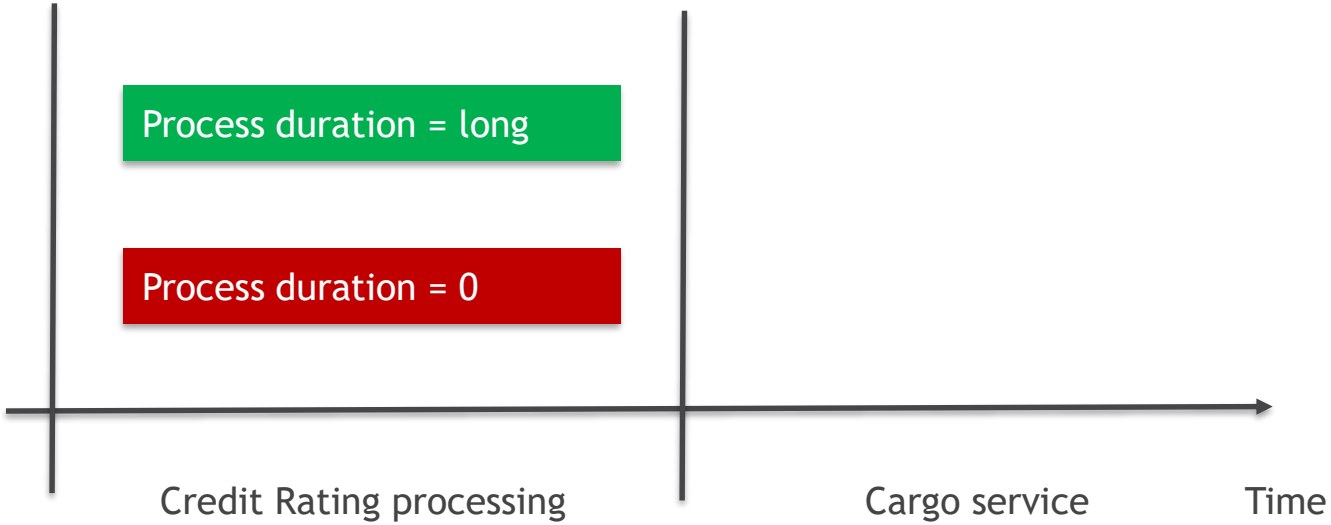
Contradiction



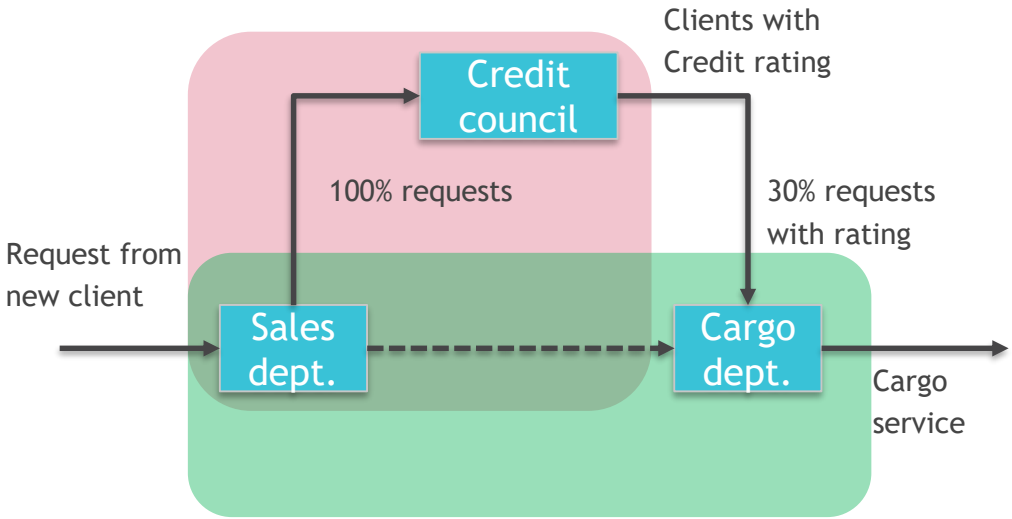
Contradiction in properties



Operational time analysis

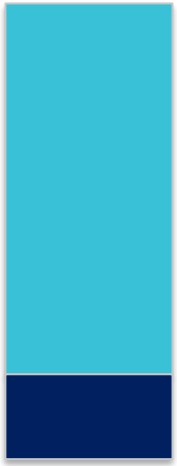


Operational zone analysis



Credit Rating Assessment with short duration should be in Sales Department and Cargo and with long duration – in Sales Department and Credit Council

Solution Idea



Rating for client

Rating for 1st request

Ideal Final Result

Duration of the credit rating assessment process itself changes from 0 to the required time

Solution

After receiving request from new Client Sales Person makes shortened creditworthiness evaluation procedure and sets Credit Rating sufficient for 1-2 orders. After the start of the 1st Cargo Sales Person sends a request to the Credit Council to execute full Credit Rating assessment procedure.

TRIZ Case Study #3

IOT DESIGN PROCESS

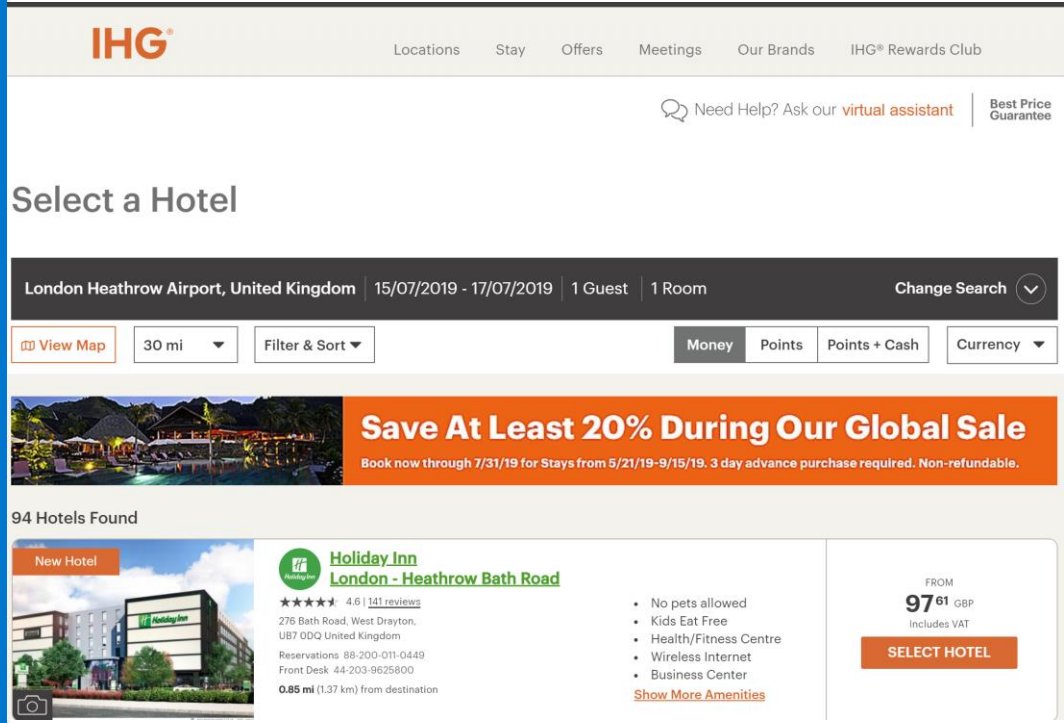
TRIZ Case Study #3

IHG PERSONALIZATION ENGINE

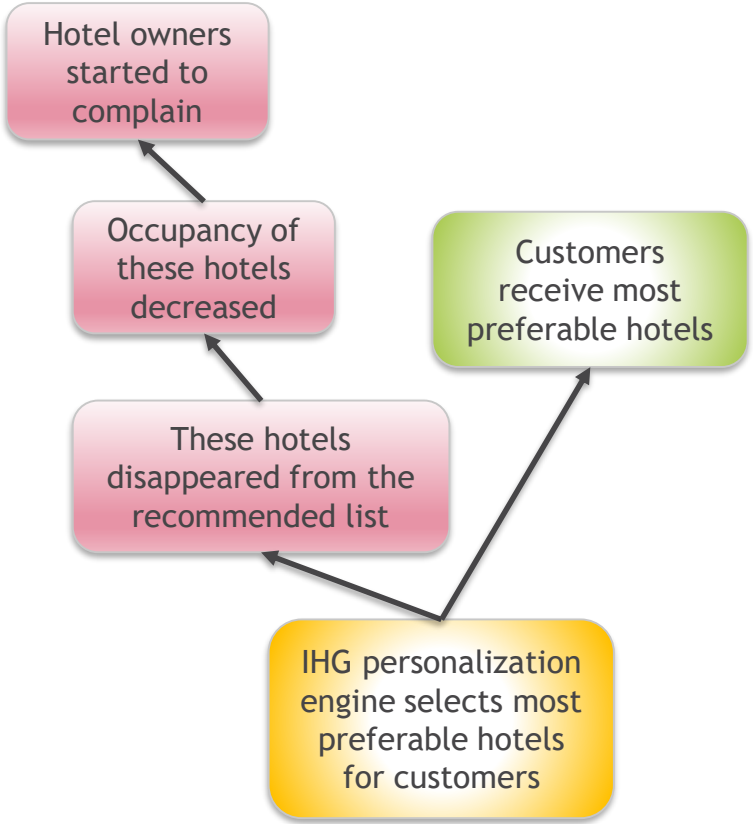
1. Problem Statement. See on the next slide
2. Approach. By RCA+ analysis we detected the contradiction then by the algorithm of inventive problem solving (ARIZ-85C) we analyzed the key contradiction and generated an idea of the solution
3. Results. Based on the generated idea the project team implemented in personalization engine a new report for hotel owners and managers that includes data about hotel options that are not allowed to personalization engine to select the hotel for current visitor. Based on these data hotel owners and managers could improve the hotel`s value propositions for visitors in the future.

Problem statement

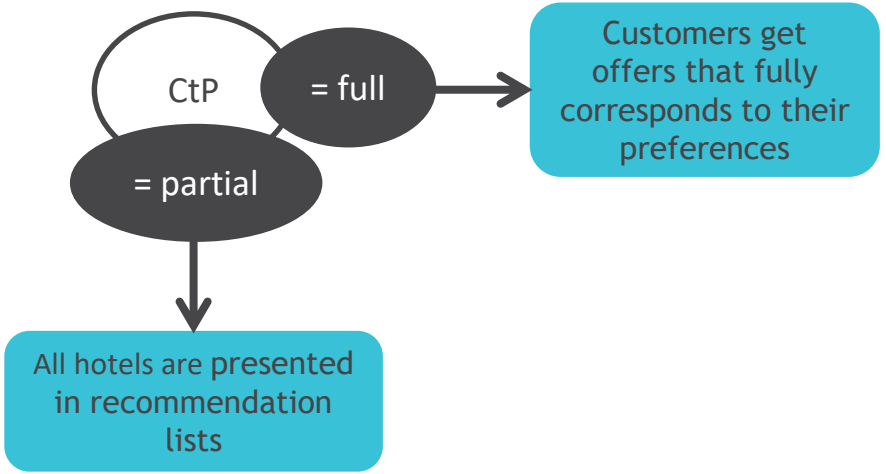
New personalization engine was deployed on the IHG (EPAM client). This engine suggests customers (site visitors) the most preferable hotels according to personal data collected. After a while some hotel owners and managers in IHG started to complain that their hotels disappeared from the list of suggested hotels.



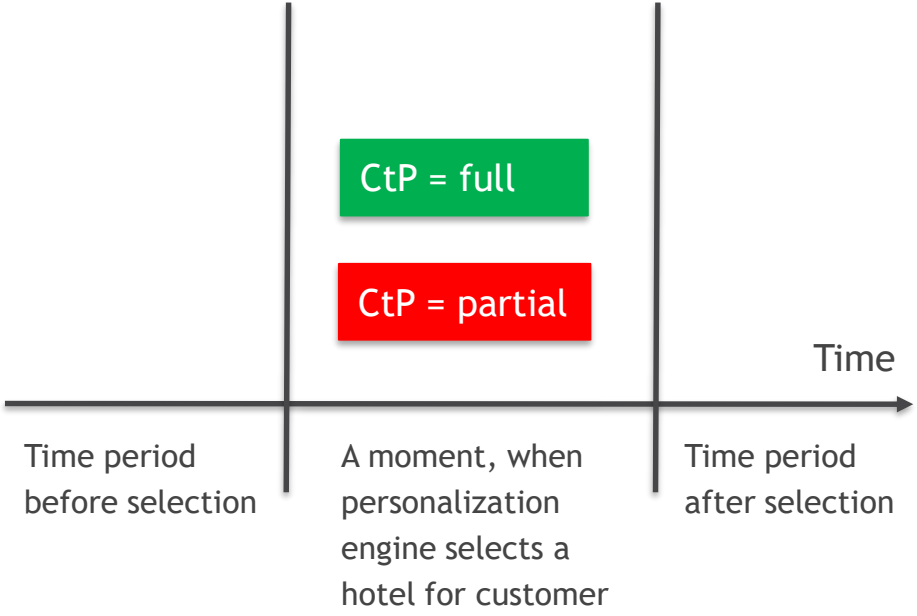
RCA+ Analysis. Contradictions

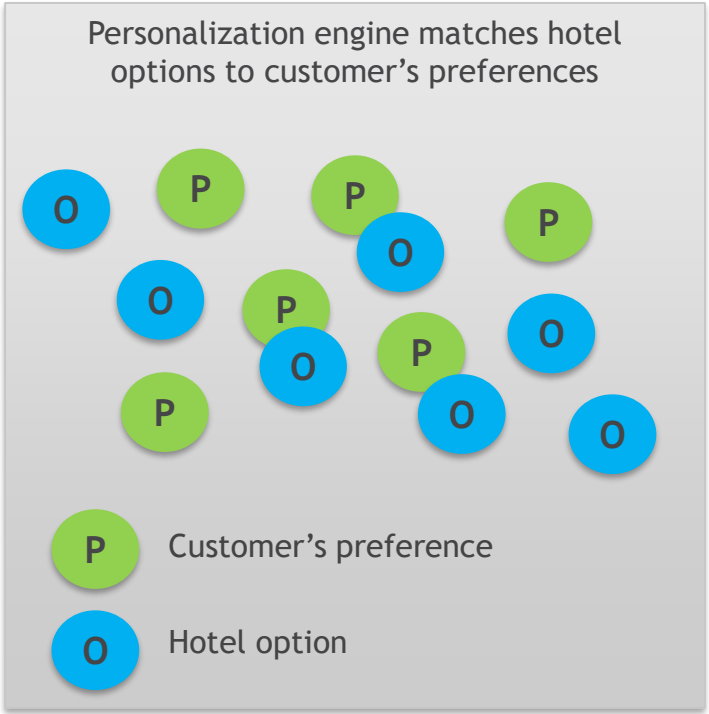


CtP - Correspondence to Preferences



Operational time and zone analysis





Solution Ideas

IHG personalization engine can generate report containing attributes and data on why these hotels are losing to selected hotels (customer`s preferences are not matched to hotel`s options).

These data can be used by hotel owners to improve their value propositions for customers.

Also these data can be used by IHG strategic marketing group for the development of new marketing program oriented to the customers (visitors) with preferences that could be fully matched to the existing hotel options.

TRIZ Case Study #5

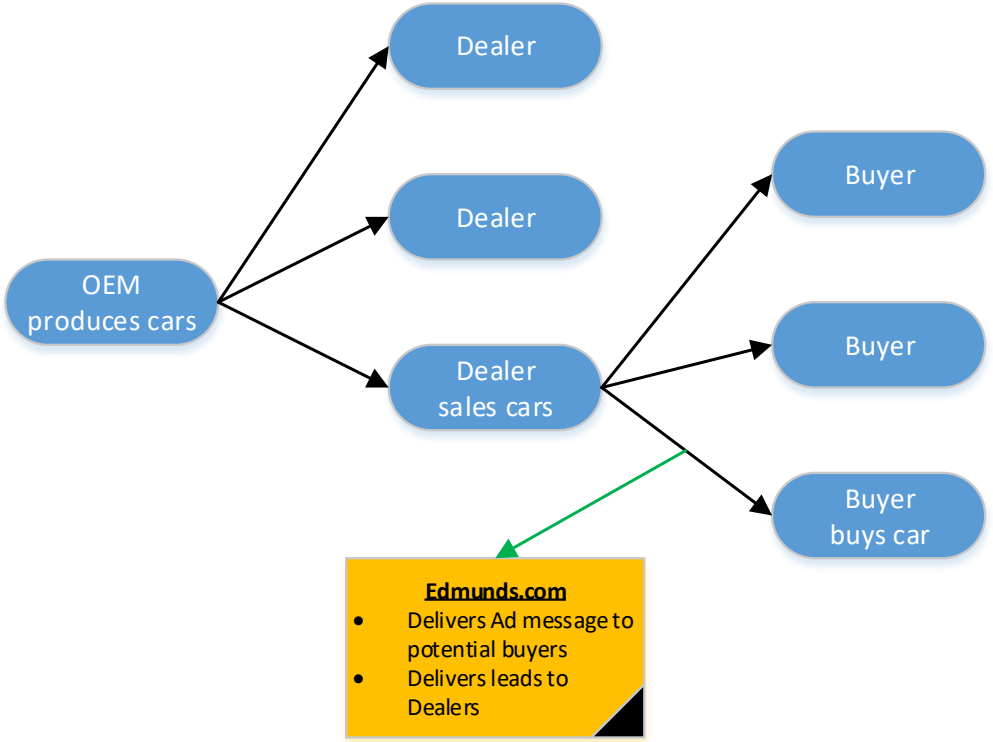
EDMUNDS PERSONAL ASSISTANT

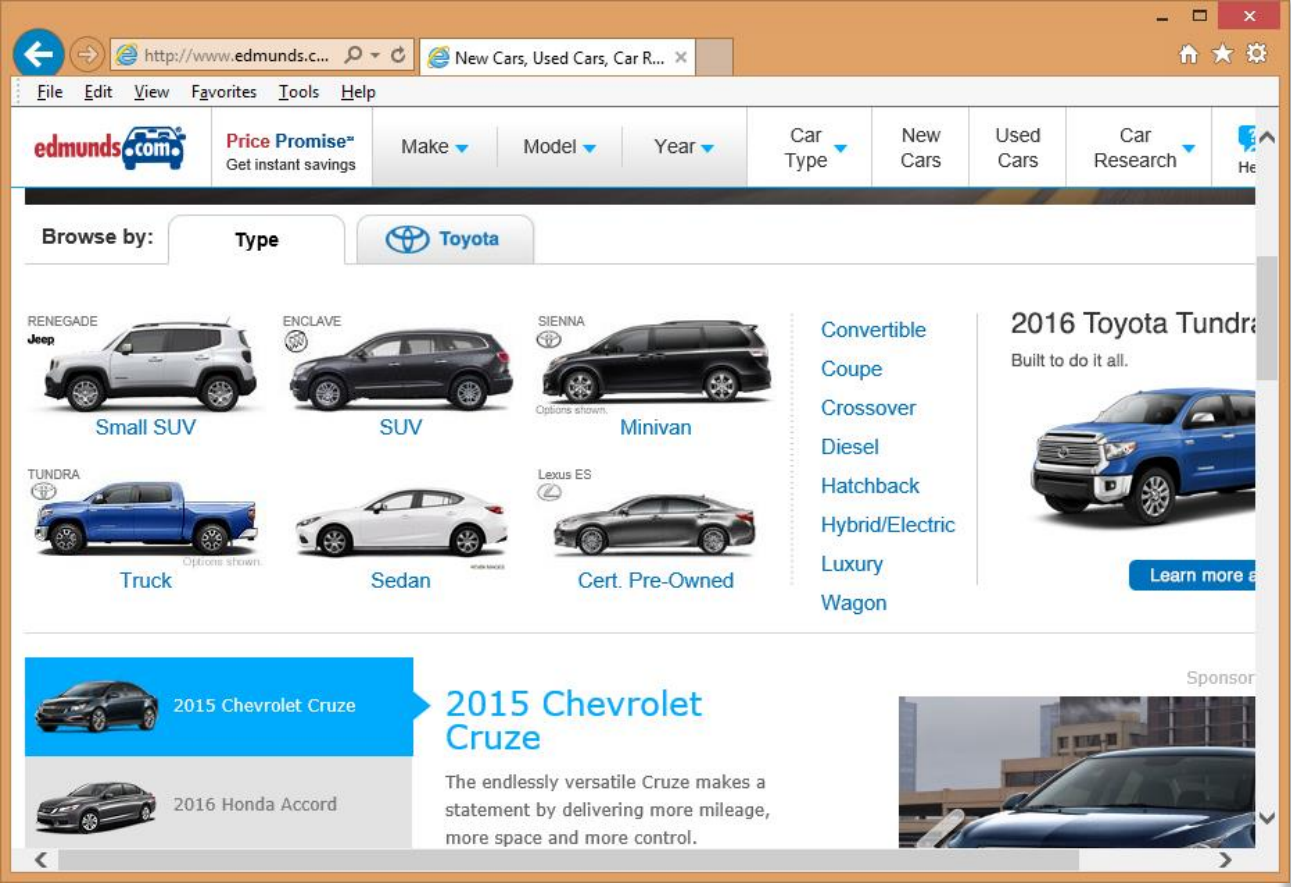
1. Problem Statement. Edmunds.com was interested to know how new Internet trends could disrupt the core company`s service.
2. Approach. We analyzed the Edmund`s value propositions and value creation schema, detected key issues and formulated key contradictions that were blocked the improvement of core Edmund`s service. Then we analyzed how existing trends can eliminate these key contradictions and how Edmunds.com can improve its service based on these trends and technologies.
3. Results. We proposed the concept of personal assistant for Edmunds`s customers that includes a chat bot on the customer`s side and makes the dialog of customer with Edmund`s site more easy and less annoying. Customer`s chat bot can automatically answer to the questions (or more of them) from the Edmund`s side needed to pick up the cars and dealers that are most preferable for this customer.

Situation: The place of Edmunds.com in the Value Network

Edmunds.com value proposition:

1. Edmunds.com publishes Dealers Ad messages for potential car buyers on the site
2. Potential car buyers visit site and find Ad messages
3. Edmunds.com delivers leads from buyers to dealers





edmunds.com

ADVANTAGES

- ✓ Edmunds.com provides a wider coverage of potential car buyers then any dealer by itself
- ✓ Edmunds.com delivers Ad messages to potential car buyers in more scalable way then any dealer itself. It means less expenses per Ad message
- ✓ Edmunds.com provides additional information services for dealers and car buyers: statistical reports, car models reviews and so on.

Situation: Edmunds.com Business model Questions

1. What technological trends will lead to the emergence of solutions that will deliver Ad messages to car buyers more accurately and cheaply than Edmunds.com?

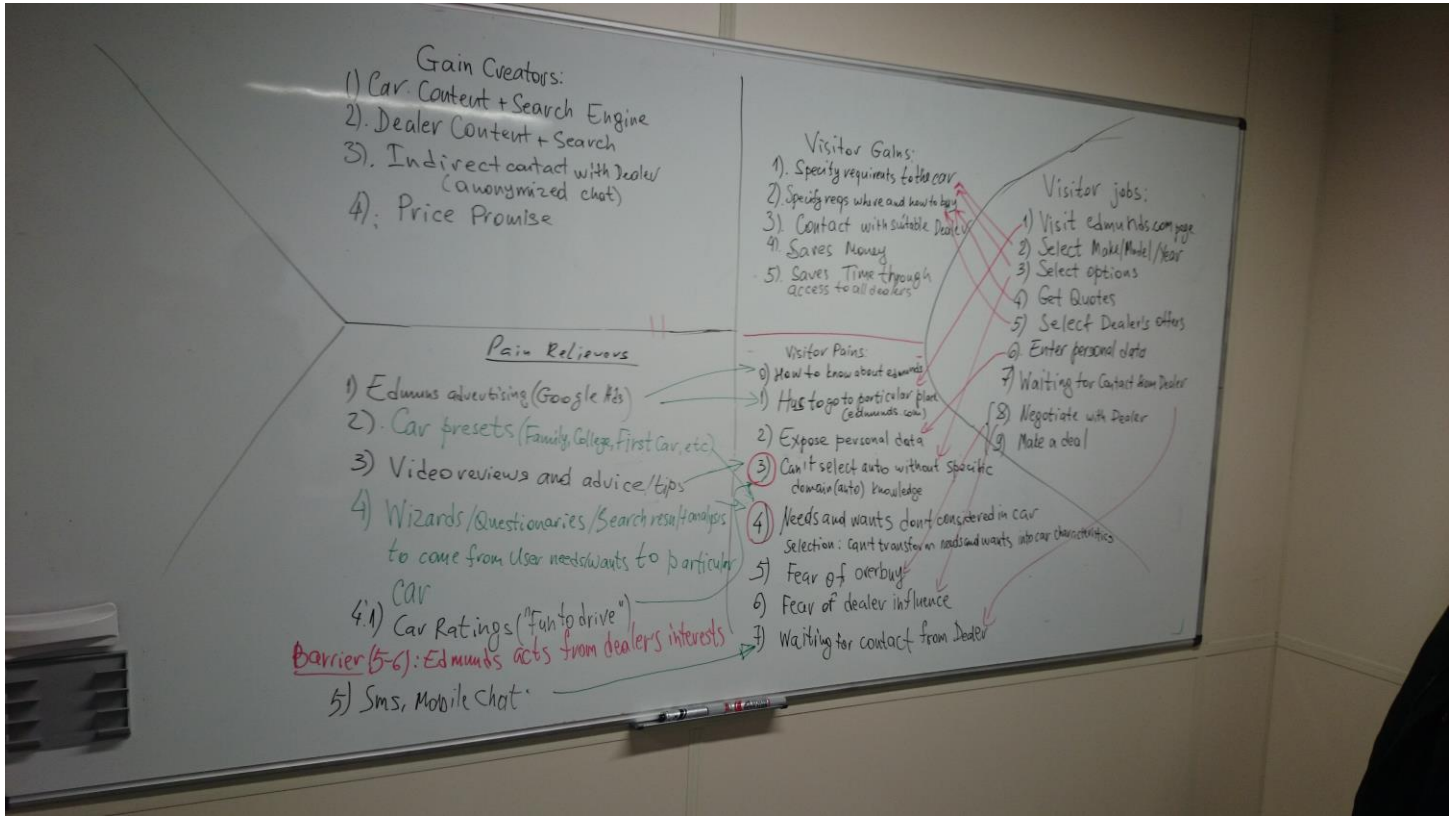
2. What inventive problems have to be solved?

3. Who and when will solve these inventive problems?

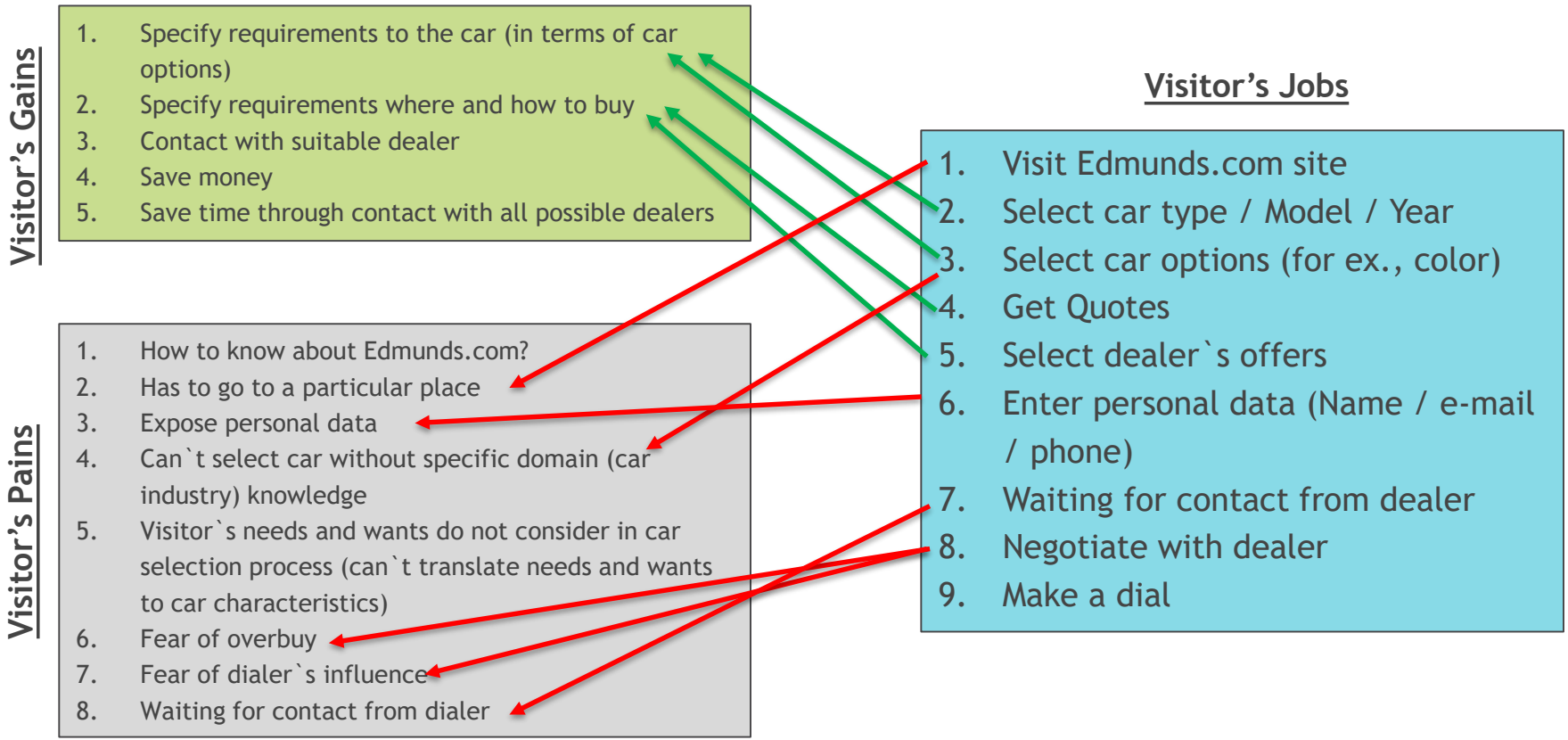
Personas

1. Visitor
2. Dealer
3. Edmunds

Edmunds.com Value Proposition Model for Visitor



Edmunds.com Value Proposition Model for Visitor



Edmunds.com Value Proposition Model for Dealer

Dealer's Gains

1. Visitor Contact
2. Visitor Personal Info
3. Information Delivery Guarantee
4. Additional profit from insurance/credits/service
5. Best approach to inform audience

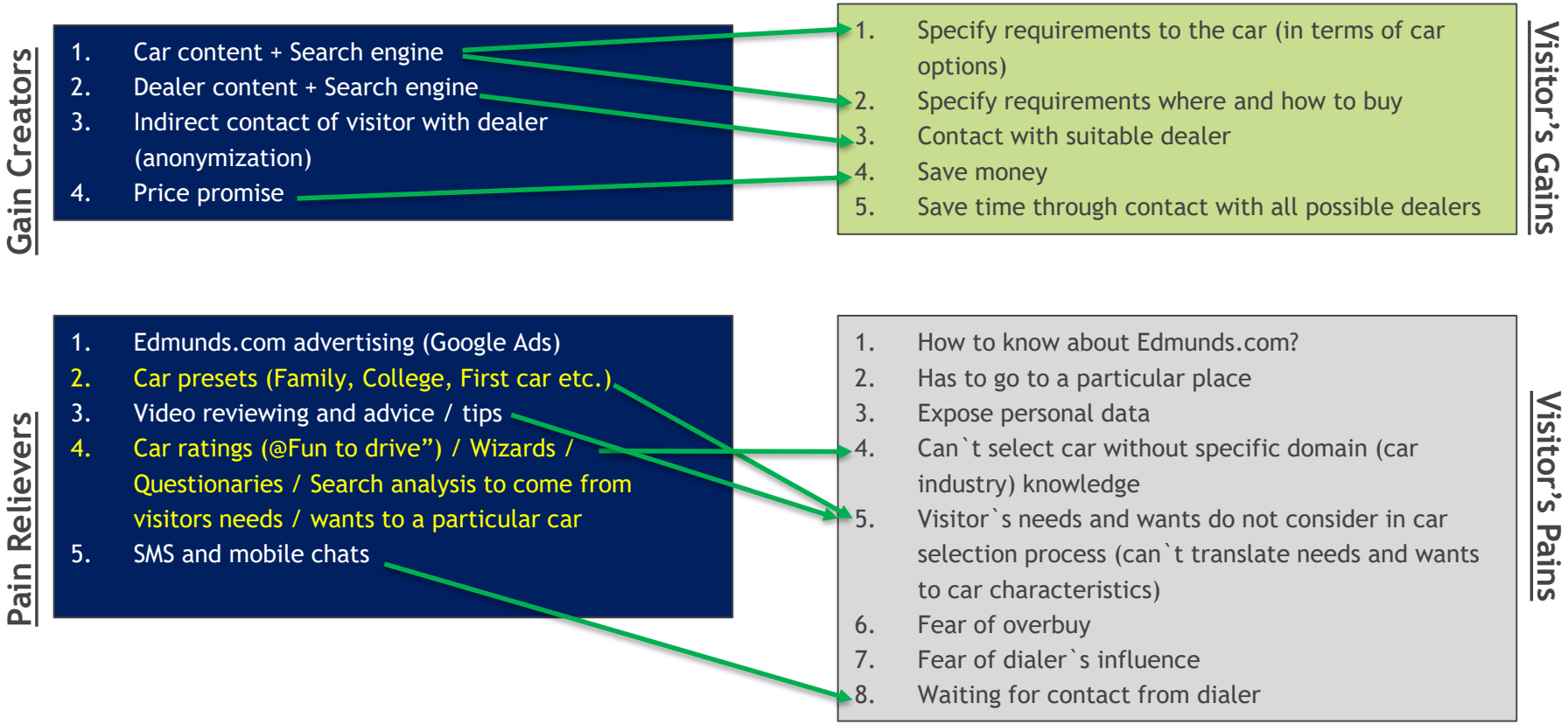
Dealer's Pains

1. Margin Decrease on Informed Visitors
2. Have to Pay for Lead not for Deal
3. Too little info about Visitor
4. No opportunities to show additional services before visit

Dealer's Jobs

1. Get Visitor Contact
2. Publish Car details and list of available cars on Edmunds.com
3. Promise discount
4. Call and invite visitor
5. Negotiate Deal with Visitor
6. Complete Deal
7. Deliver Car
8. Pay for Ads/Leads
9. Understand visitor's needs and wants
10. Discover extra options to sell (manipulations, etc.)
11. Engage Visitor into deal
12. Credit Programs
13. Insurance options
14. Car maintenance programs

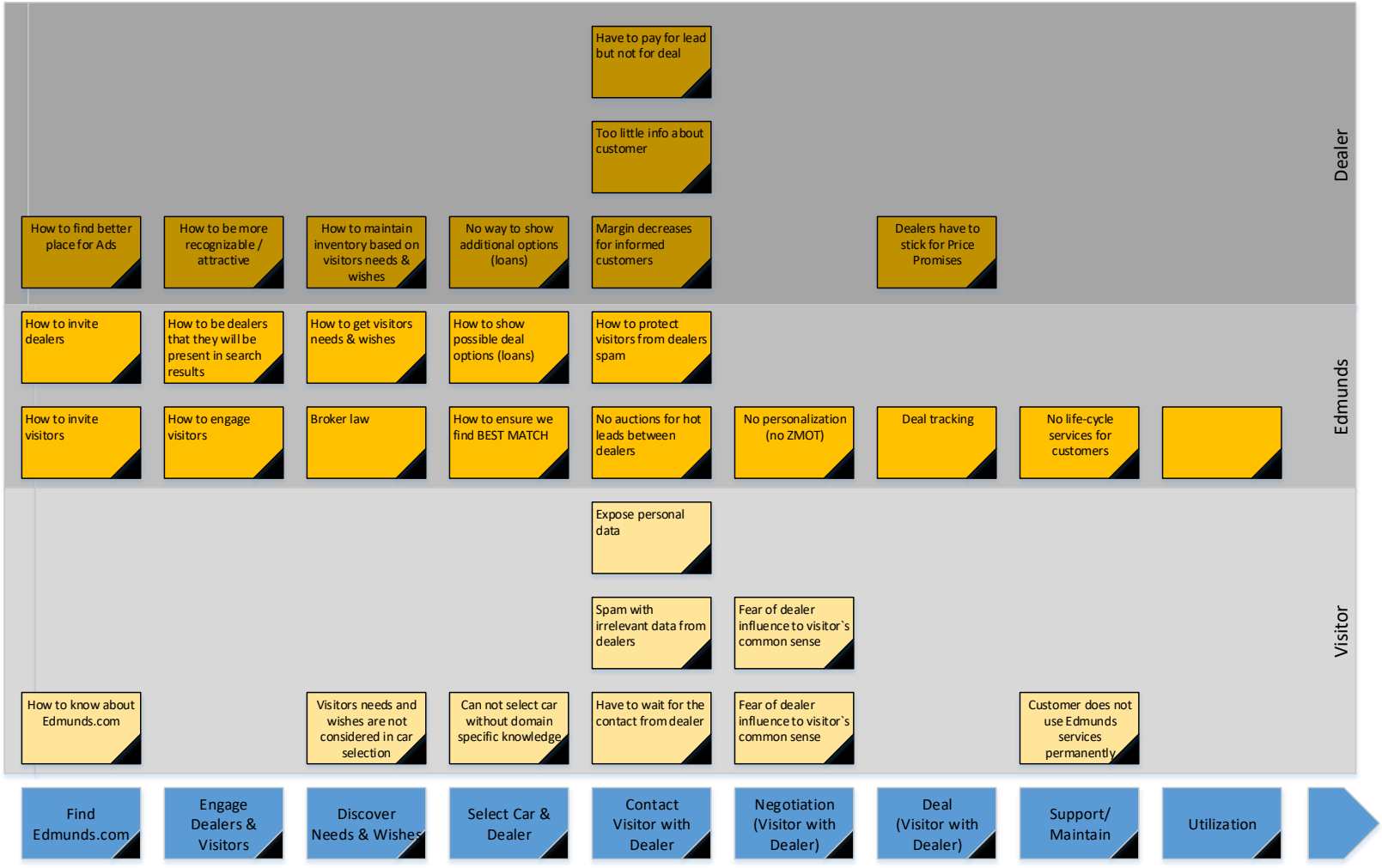
Edmunds.com existing solutions



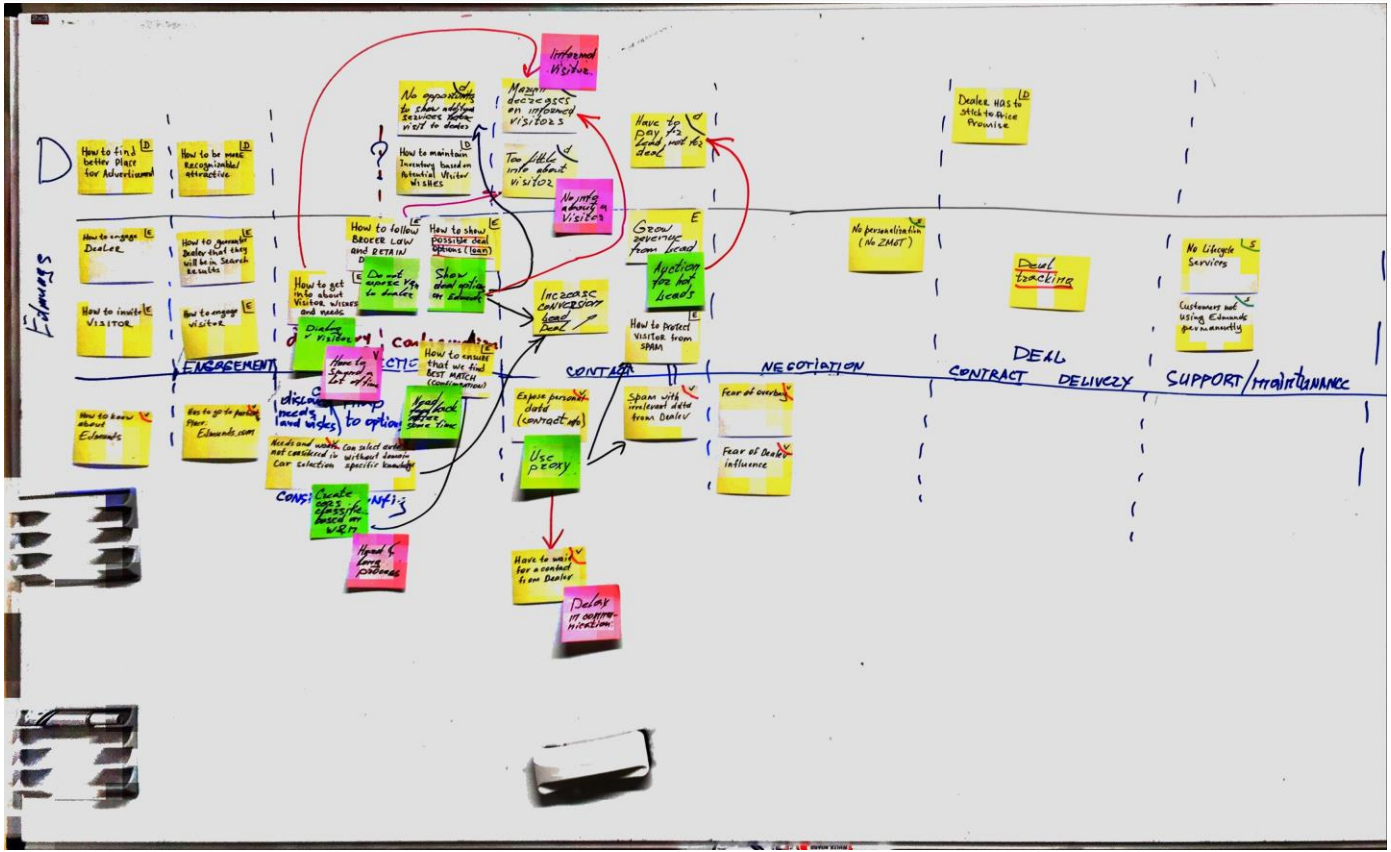
Multi-Screen Operator

PAST	PRESENT	FUTURE
Cars retail Network	Cars retail Network	Cars manufacturing/retail/recycle Network
Cars Information delivery system (Spam from dealers)	Cars Information delivery system [needs, wants, fears] (Notes: No Lifecycle services Customers are not using the system permanently No personalization (no ZMoT) Doesn't know who are their users)	Cars information delivery and Cars Lifecycle value added services [needs, wants, fears] transformation
Dealers Byers Ads -> Hard/digital Contact (Buyer – Dealer) Deal	Dealers Byers Edmunds.com Ads (digital, targeted) Contact (B->D) Deal w/guaranteed price	Dealers Byers OEM Car Service Insurance Deals Trade-In-Deals Guaranteed Price

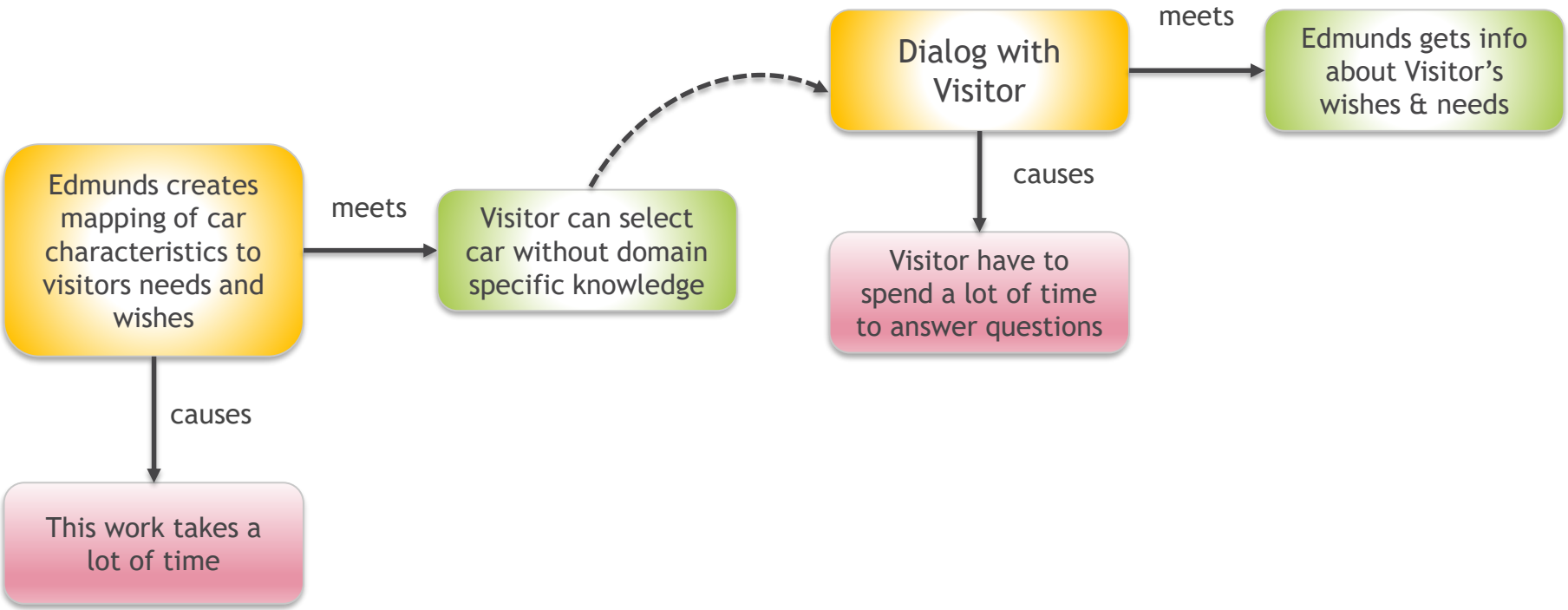
LIST OF PROBLEMS



Edmunds.com Value Network Contradictions



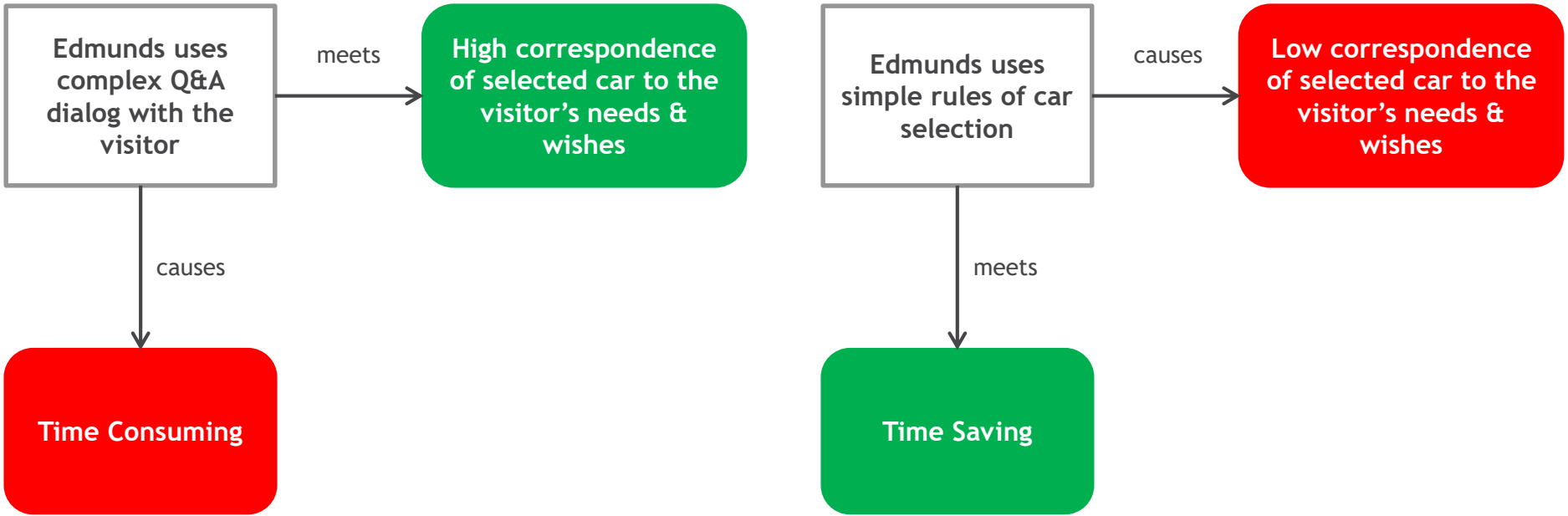
Selected contradictions



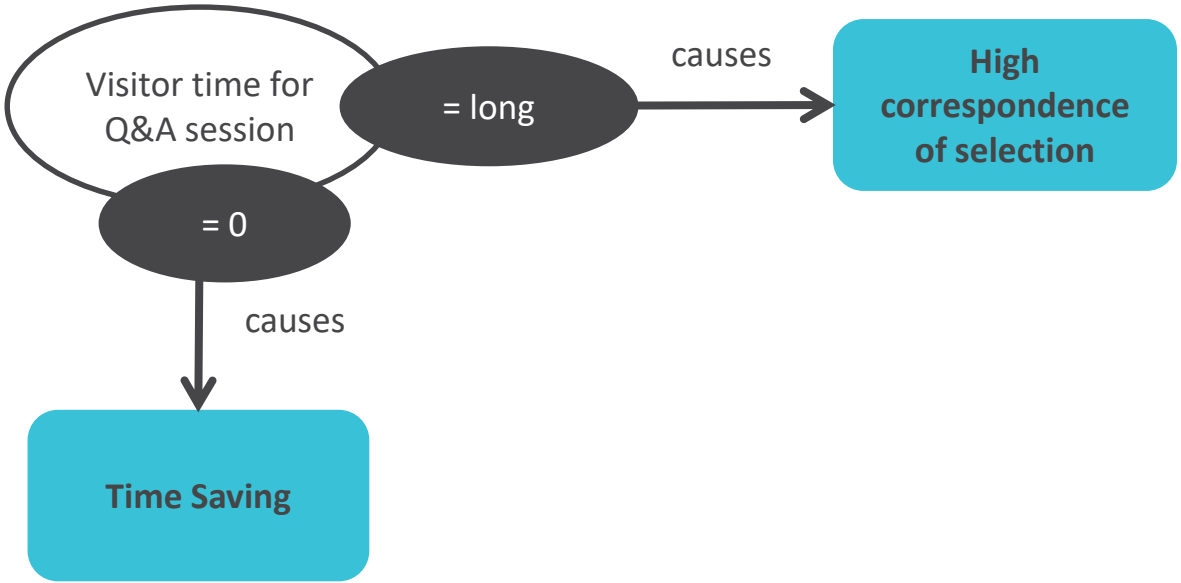
List of selected contradictions

Known solution	Requirements	Negative Effects
Dialog with visitors	• allows to get info about visitor`s needs and wishes • Makes visitor more happy and informed about what car he/she needs	• Visitor have to spend a lot of time and efforts • Decreases dealer margin due to buyer know what car he/she needs
Creation of car registry based on needs and wishes	• allows to select car without domain specific knowledges • increase conversion of visits to leads	require to develop this classificatory (hard and time expensive process)
Closing of visitor's needs and wishes for dealer	compliance with the broker's law	dealer will have not information about buyer (visitor) requirements
Opening of visitor's needs and wishes	Make visitors more happy and increase conversion of visits to leads	Decreases dealer margin due to buyer know what car he/she needs
Usage of proxy during contact of visitor with dealer	Defenses visitor from dealer's spam	• Visitor have to wait the respond from dealer • Creates delays in communications
Auction for hot leads	Increases Edmunds revenue from leads	Dealers have to pay for leads not for deals

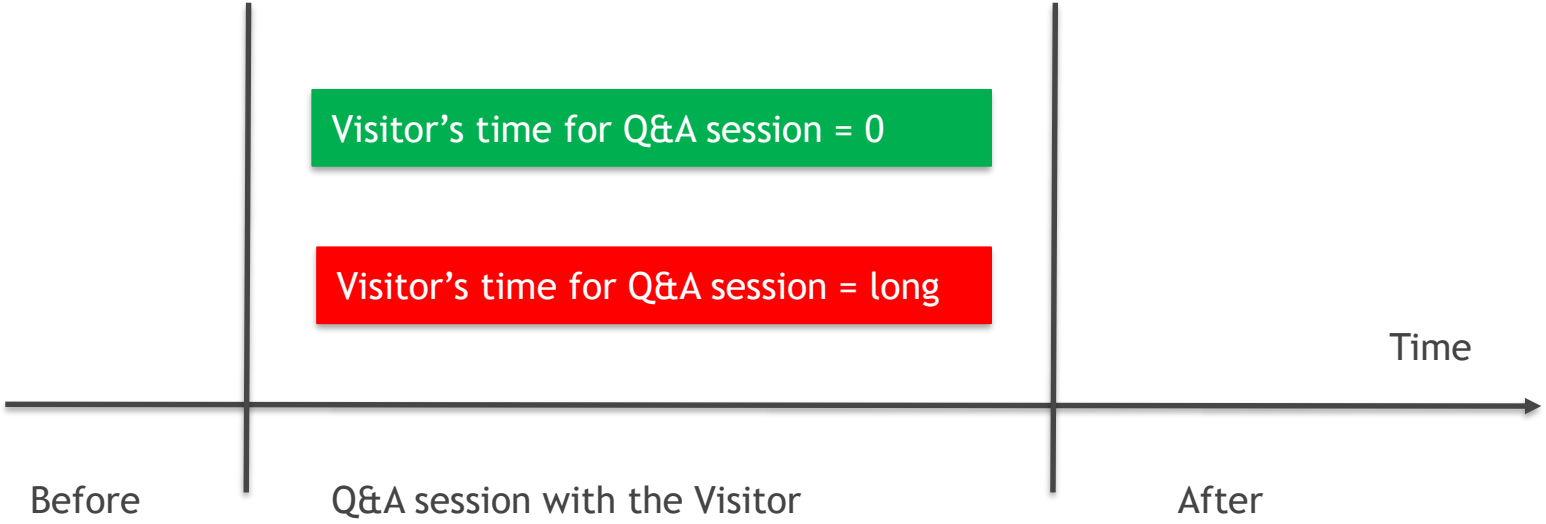
Contradiction



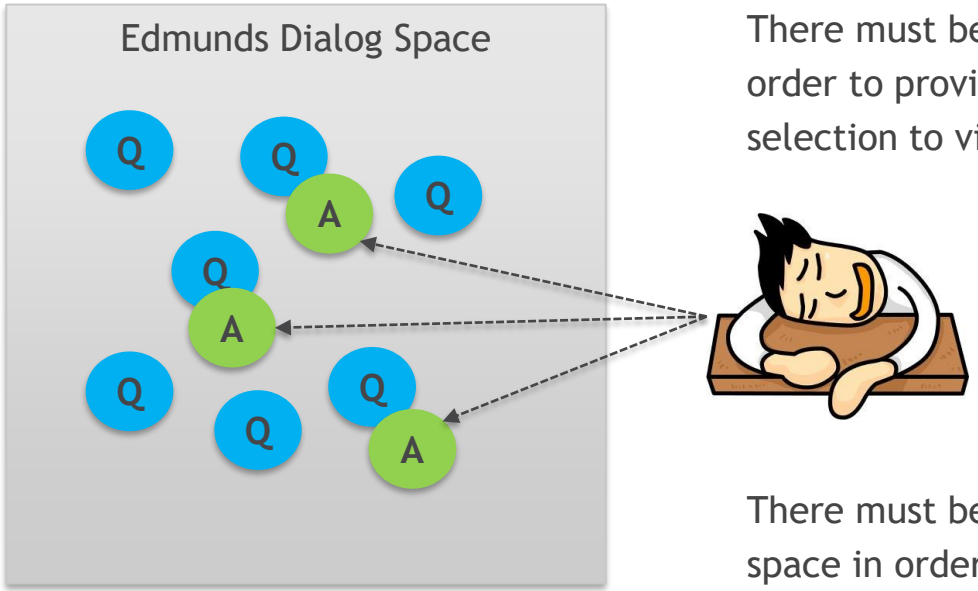
Contradiction in properties



Operational time analysis



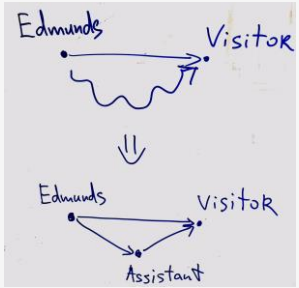
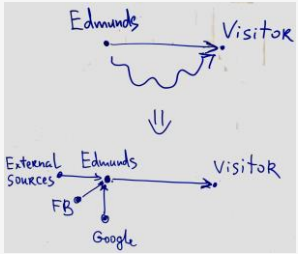
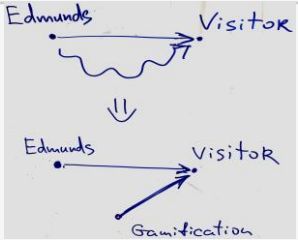
Operational zone analysis



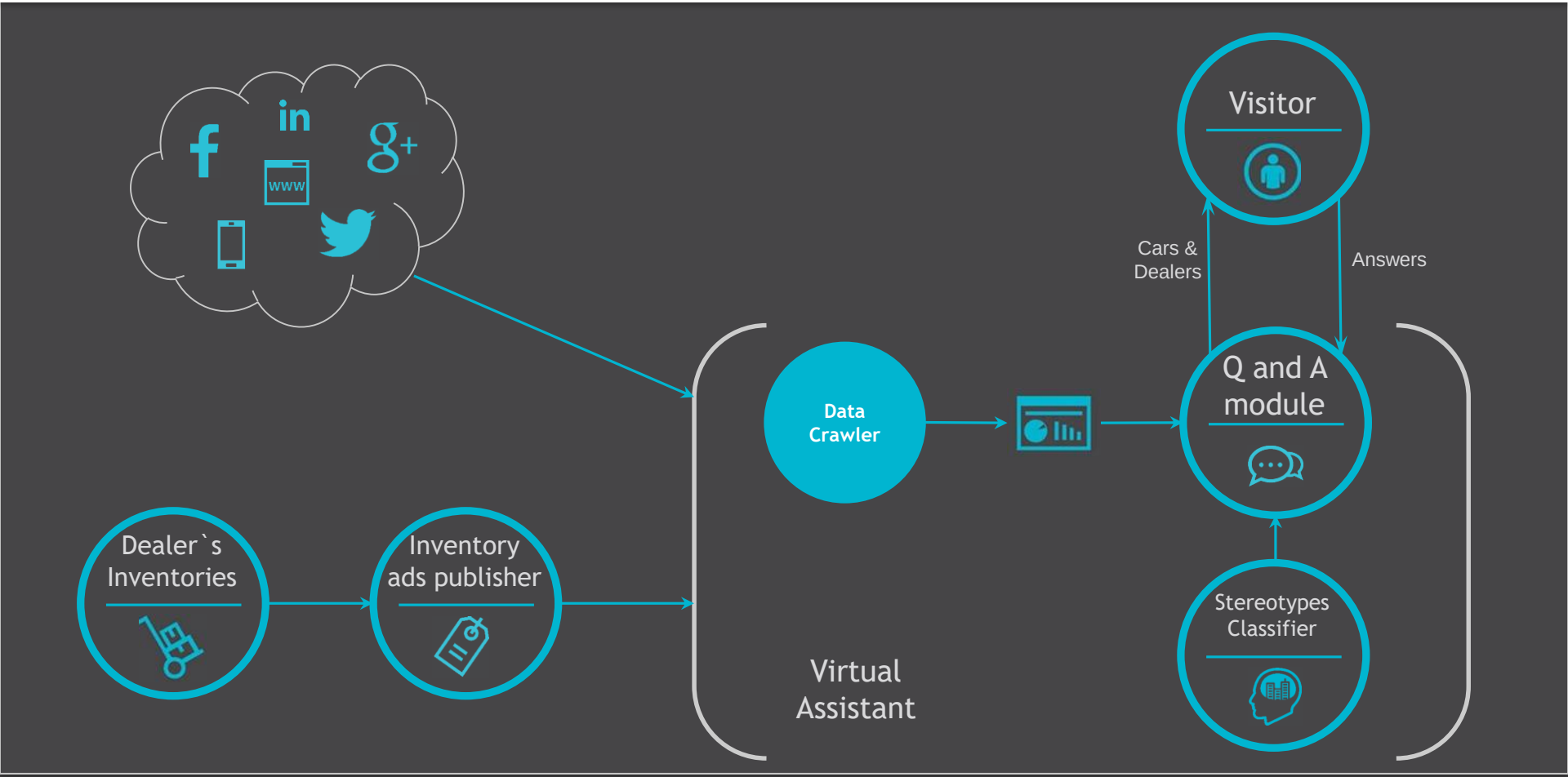
There must be a lot of answers in the dialog space in order to provide high correspondence of car selection to visitors' needs & wishes

There must be minimal (or NO) answers in the dialog space in order to save visitors' time

Su-Field Model and Solution Ideas

	According to Inventive Standard 1.2.1 recommends to insert mediator that masks harmful action. The Idea is to create assistant that will collect visitor's answers made in the past (not only at Edmunds.com, but at any place in the Internet).
	According to Inventive Standard 1.2.2 we can add additional elements to Edmunds. The idea is to use different places in Internet to collect visitor's preferences (for example, from FB, Google, etc.)
	According to Inventive Standard 1.2.4 we can additional field (impact) that compensate (pull back) harmful effect to the visitor. The Idea to use Gamification tools (for example, badges/gifts/perks for questions answers)

VIRTUAL ASSISTANT AS A VISITOR CHATBOT



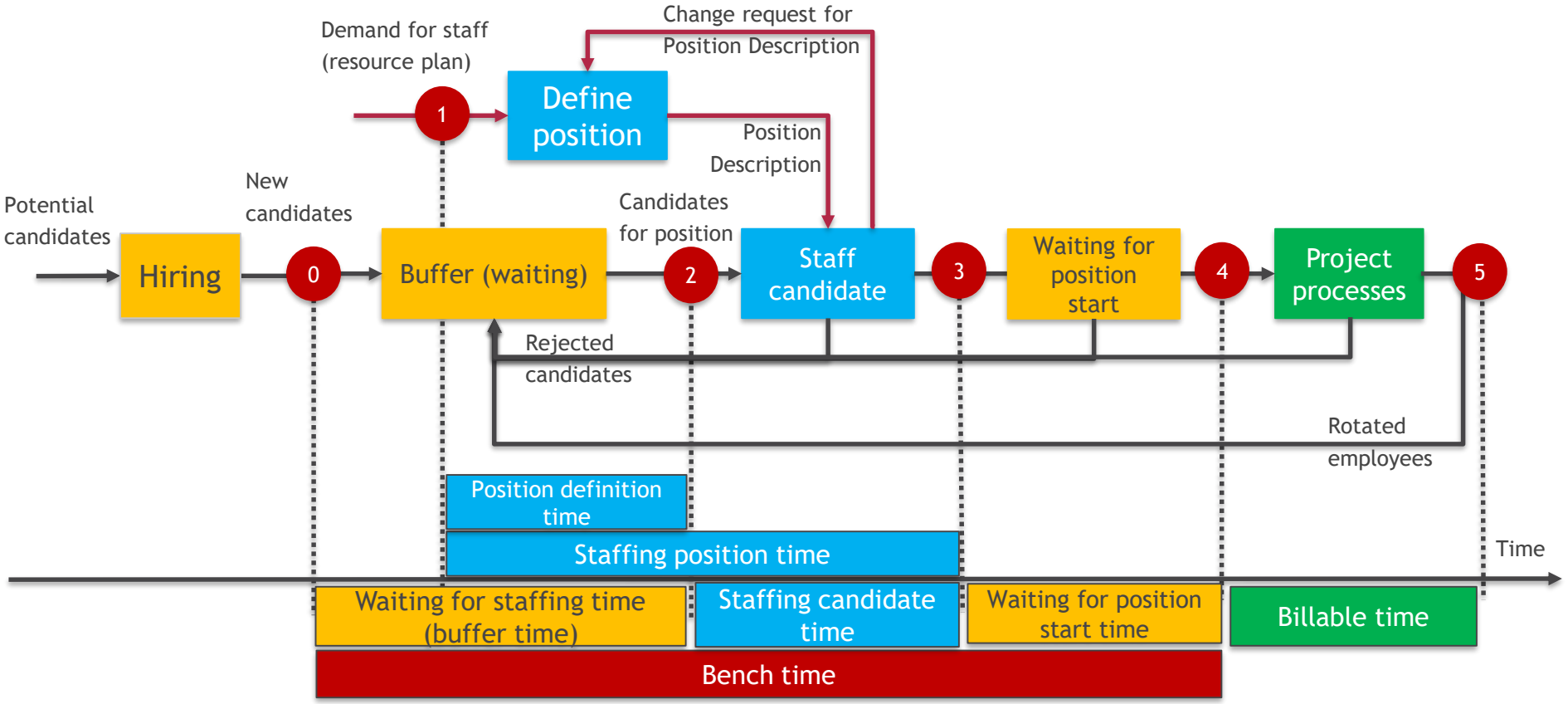
TRIZ Case Study #6

EPAM STAFFING PROCESS

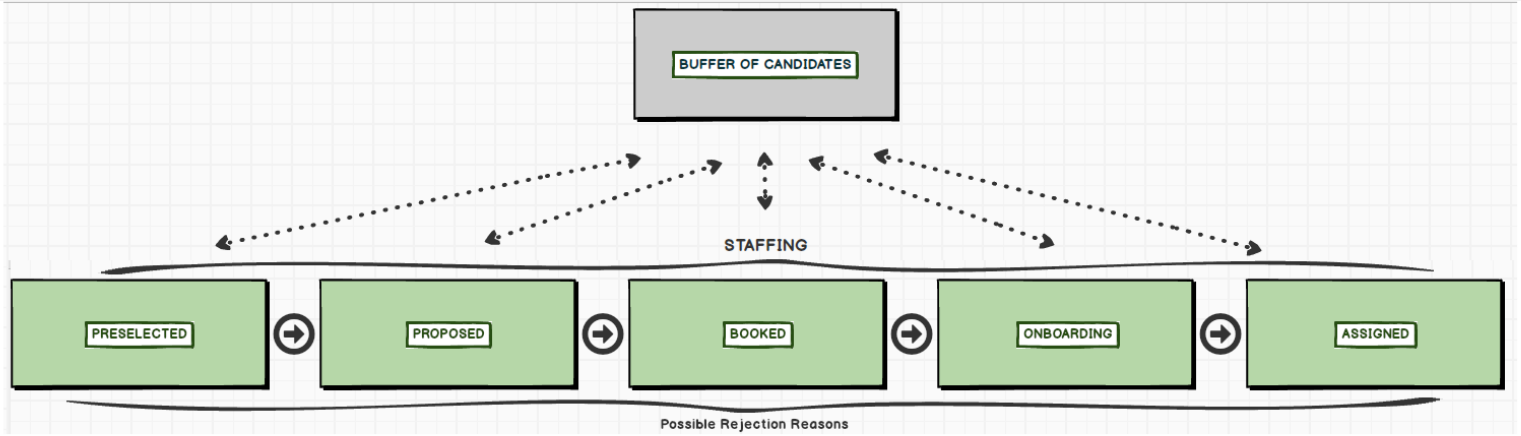
Summary

1. Staffing model. *Staffing cycles*. How to decrease both of bench costs and revenue leakage.
2. Staffing process AS IS. *Rejection* and *Rejection reason* concepts.
3. *Certain* and *Uncertain* requirements and attributes.
4. Staffing candidate process as a set of *validations*.
5. Transformation of *human validations* to *automatic* ones.
6. How to decrease the number of rejections of candidates.
7. Ranking Employees by *staffability*.
8. Automatic *Rejection* and *Rejection reason* registration.

Staffing model



Staff Candidate Process AS IS



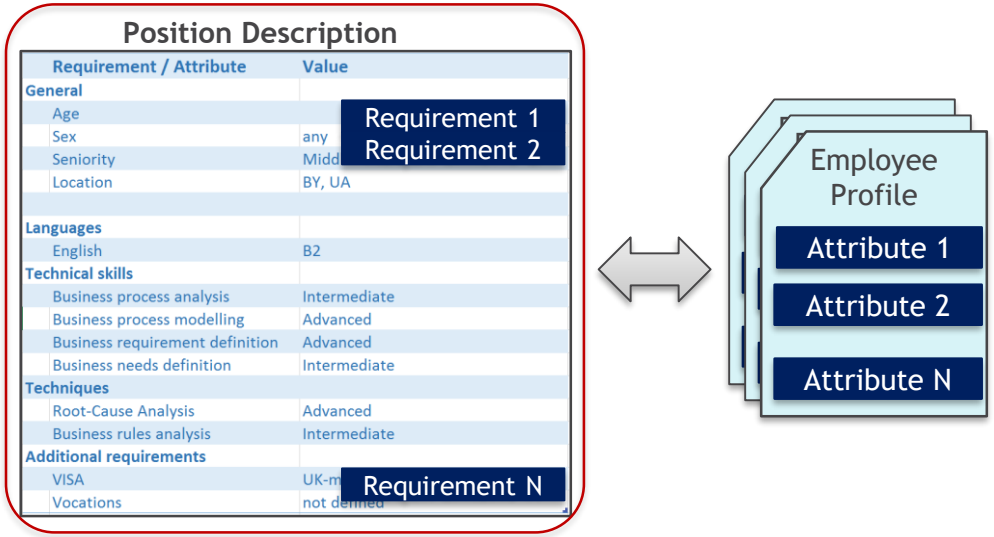
- Improper English level - should be validated and confirmed on Preselection stage - assessment, validation with speakers, etc.
- Nonrelevant skillset
- Seniority level discrepancy
- Wrong location

} should be compared with requirements by Staffing Coordinator, RM, etc.

- Low quality profile - Should be validated by CV service or auto calculated by system

Rejection Caused by Candidate	RCC
Rejection Caused by Business	RCB

Position description & Employee Profile



“Certain” requirement / attribute

All stakeholders including client understand this requirement/attribute identically, for ex., “English level”, “Visa”, “Location” ...

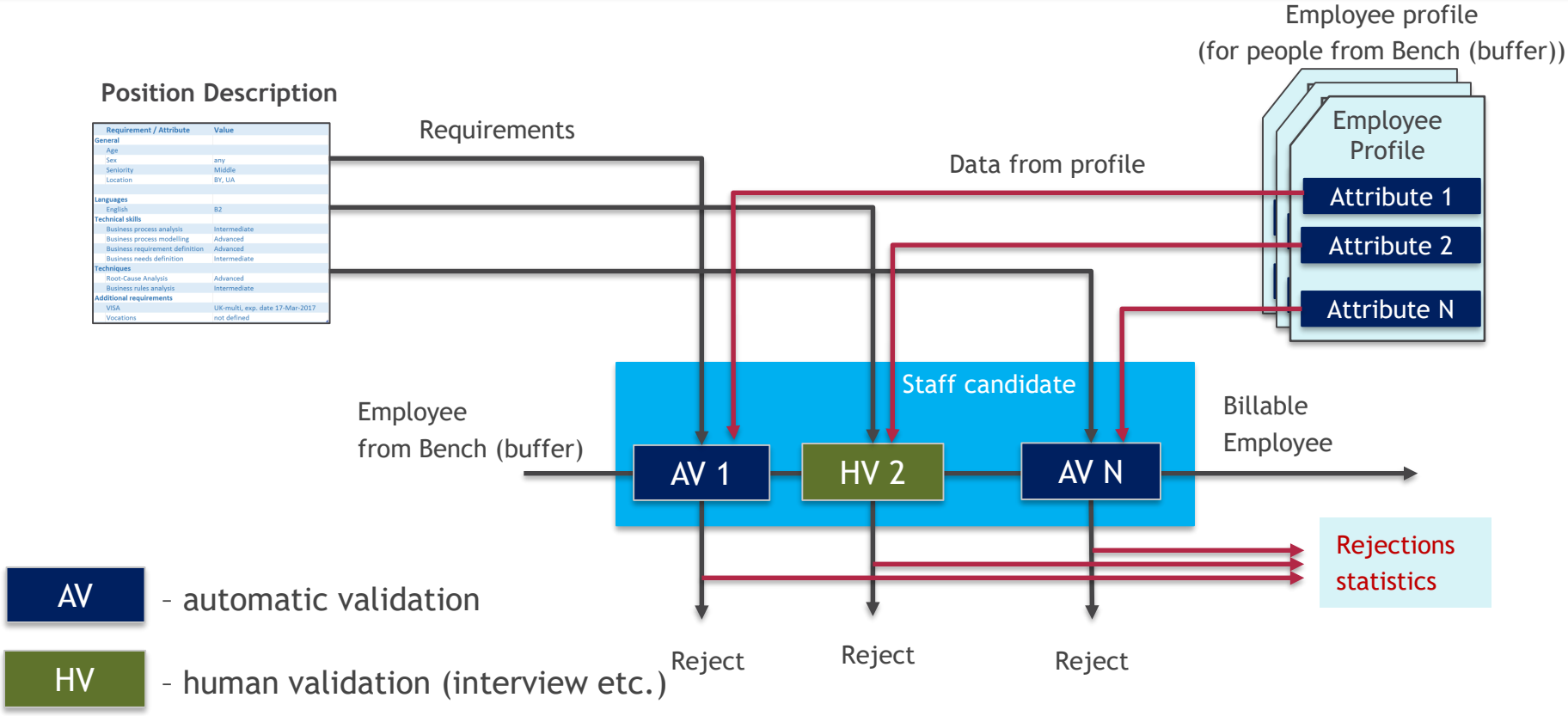
“Internally (in EPAM) Certain”

All EPAM stakeholders understand this requirement /attribute identically, for ex., “Seniority level”,...

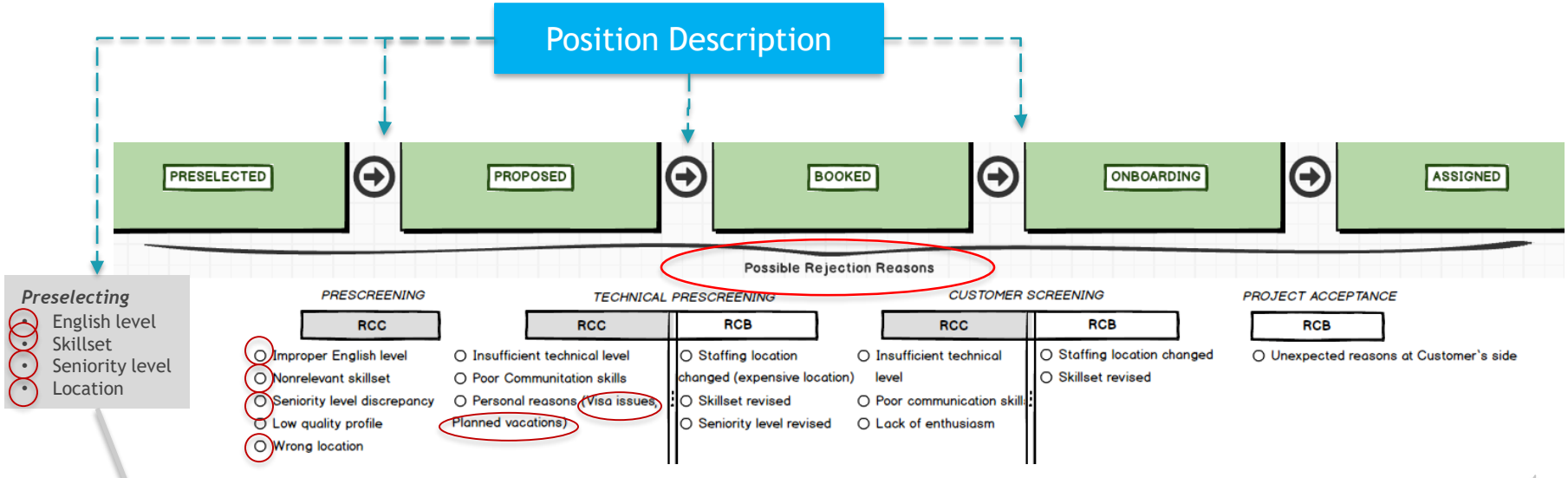
“Uncertain” requirement / attribute

Any stakeholder can have their own interpretation for the value of requirement / attribute for ex., «Communication skills»

Staff candidate process TO BE



Staffing Process AS IS

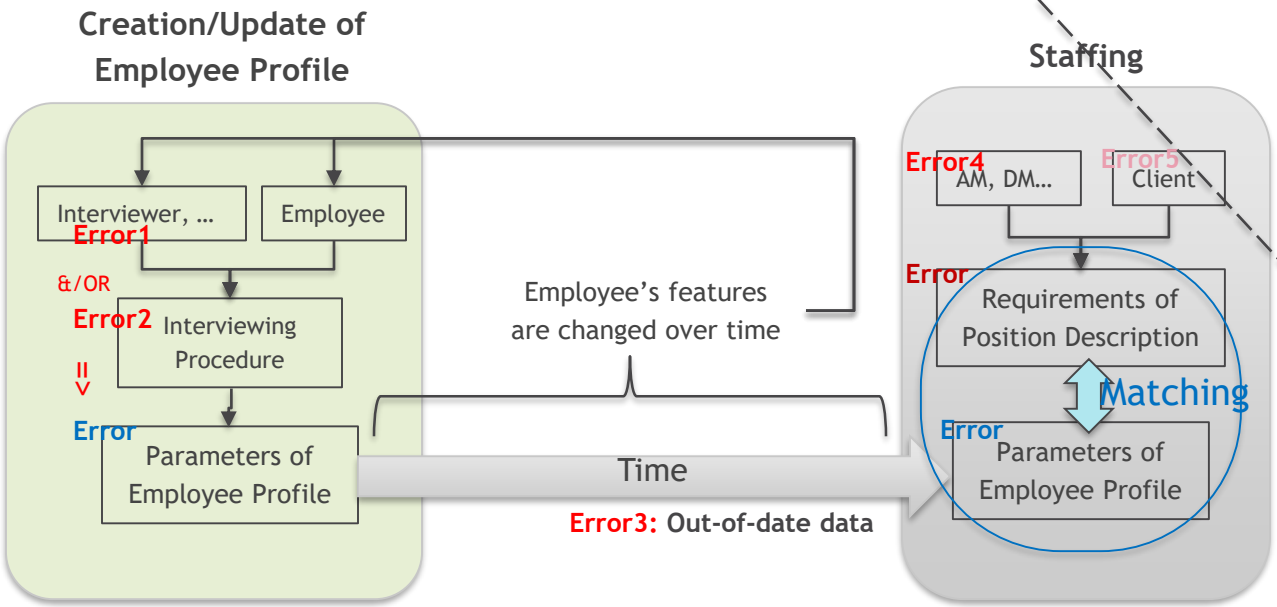


- Формальный отбор сотрудников, с подходящими значениями параметров Employee Profile

- “Duplicated” rejects are the results of “duplicated” validations. What are the reasons?
- Why are the potentially “certain” parameters as “Visa”, “Vacation” verified so late, on the third stage?

Reasons for *(not "parallel" !)* Rejections

Moving target, revised… Rating for AM, DM skills



Errors Description (Reasons)

Error1: Interviewer isn't skilled enough

Error2: Interviewing Procedure isn't effective

Error3: Out-of-date data (no update)

Error4, 5: AM, DM or Client has revised the requirements

Error6: RM (?) intentionally selected Employee with parameters that don't match to Position Description

Error6: Others ????

- **Knowledge about reason of rejection can allow us to constantly monitor and improve staffing process**

Identifying the Causes of *(not "parallel" !)* Rejections. Example

Rejections: English level - insufficient

Interview – on the stage of Employee Profile generation or planned Attribute update

Boolean Variables: *Interviewer, Interviewing Procedure, Customer, On time Update*

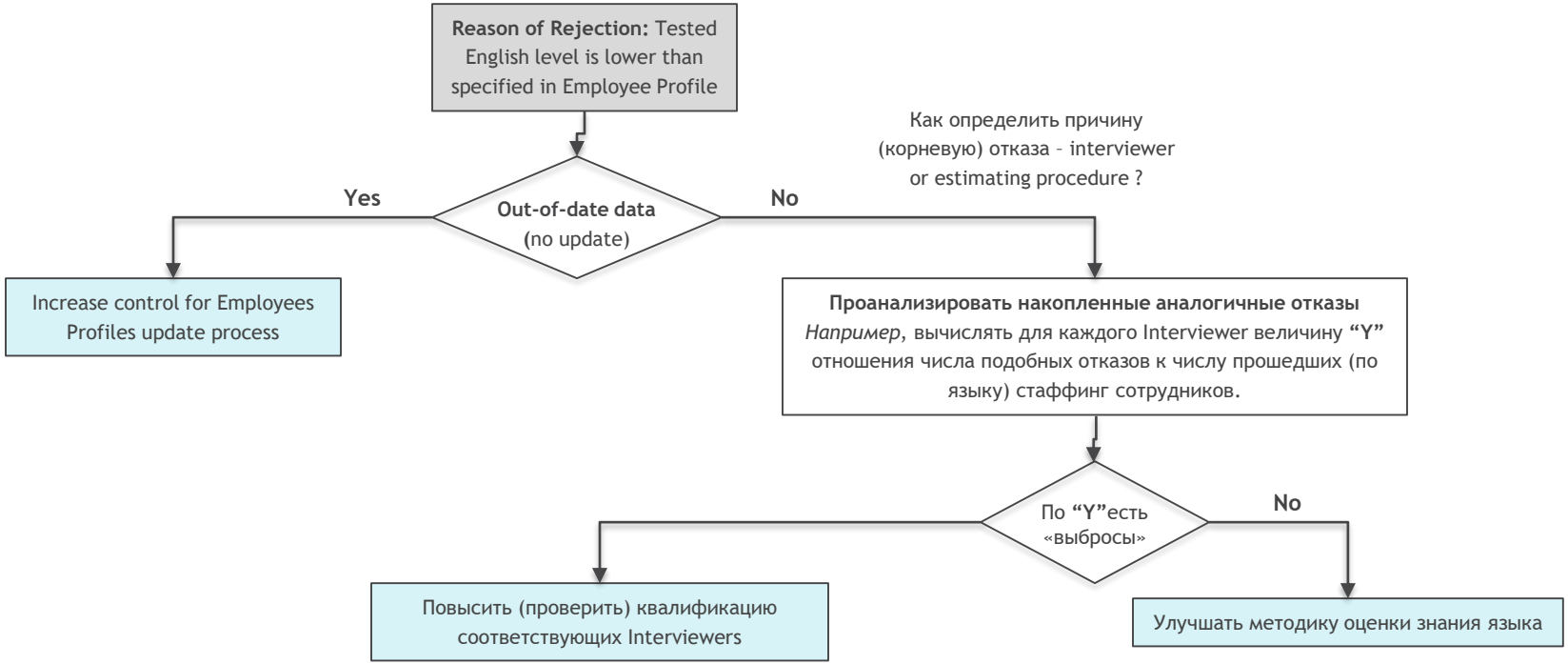
Based on analysis of rejection statistics

IF Rejected Employees were interviewed by *the same Interviewer* **AND** rejected by *different Customers* **AND** *Update was on time* **THEN** Interviewer skills should be improved

IF Rejected Employees were interviewed by *different Interviewer* **AND** rejected by *the same Customers* **AND** *Update was on time* **THEN** Interviewing procedure should be revised

IF …. **THEN ….**

Identifying the Causes of *(not “parallel” !)* Rejections. Example



Action Plan (draft)

1. **Анализ существующих в БД полей (в презентации – аттрибуты=поля), относящихся к сущности Employee Profile.**
   Цели анализа:
   - Определить список полей, значения которых стандартизированны “в мире” (например, уровень английского B2) и/или в рамках компании (например, Seniority level = L2). Отметить, для каких полей значения выбираются из классификатора.
   - Определить список полей, значения которых записываются в «вольной форме».
     - Что такое “Technical level”? Как измеряется? Что такое “Insufficient Technical level”?
     - Что такое “Quality profile”? Как измеряется? Что такое “Low quality profile” ? (**Ольга, Андрей**, команда «телескоп»)

2. **Проанализировать происходящие Rejections, с целью выявления недостающих полей в Employee Profile.** Пример: На третьем этапе отбора (Technical Prescreening) встречаются Rejections по таким причинам, как Personal reasons (Visa issues, Planned vacation). Означает ли тот факт, что данные Employee Profiles попадают на стадию Preselected, то что в БД нет полей с данными по наличию/отсутствию визы, датам планируемого отпуска ? Или поля есть, но содержат неверные данные? Если таких полей нет, то возможно их надо добавить. (Desk team – since Q2, Apr)

3. **Сбор и анализ Reasons (Cases) of Rejections,** дополняющих и/или детализирующих причины, указанные на слайде 7. В результате анализа также могут быть выявлены недостающие поля в Employee Profile (п.2) (Desk team – since Q2, Apr)

4. **Разработка алгоритмов, правил** (примеры на слайдах 8-9), позволяющих определять корневые причины отказов, и соответственно определять меры по улучшению процессов компании

TRIZ Case Study #7

EPAM EXPERIENCE AQUISITION

#7 legend

1. Problem Statement. During analysis of EPAM GDO business processes the critical issue was detected. It is related to the sharing of successful experience between projects and accounts in EPAM.
2. Approach. By RCA+ analysis we detected the contradiction then by the algorithm of inventive problem solving (ARIZ-85C) we analyzed the key contradiction, defined the ideal final result, and generated an idea of the solution
3. Results. As a result of analysis we understood that the key reason of this issue is a gap between the efforts needed to formalize the successful experience at the beginning of the process and the number requests for this experience from other stakeholders in the future. We proposed the approach and architecture of the solution that allows to minimize efforts at the beginning of the process and making additional efforts depending on the number of requests from the stakeholders who are interested in this experience.

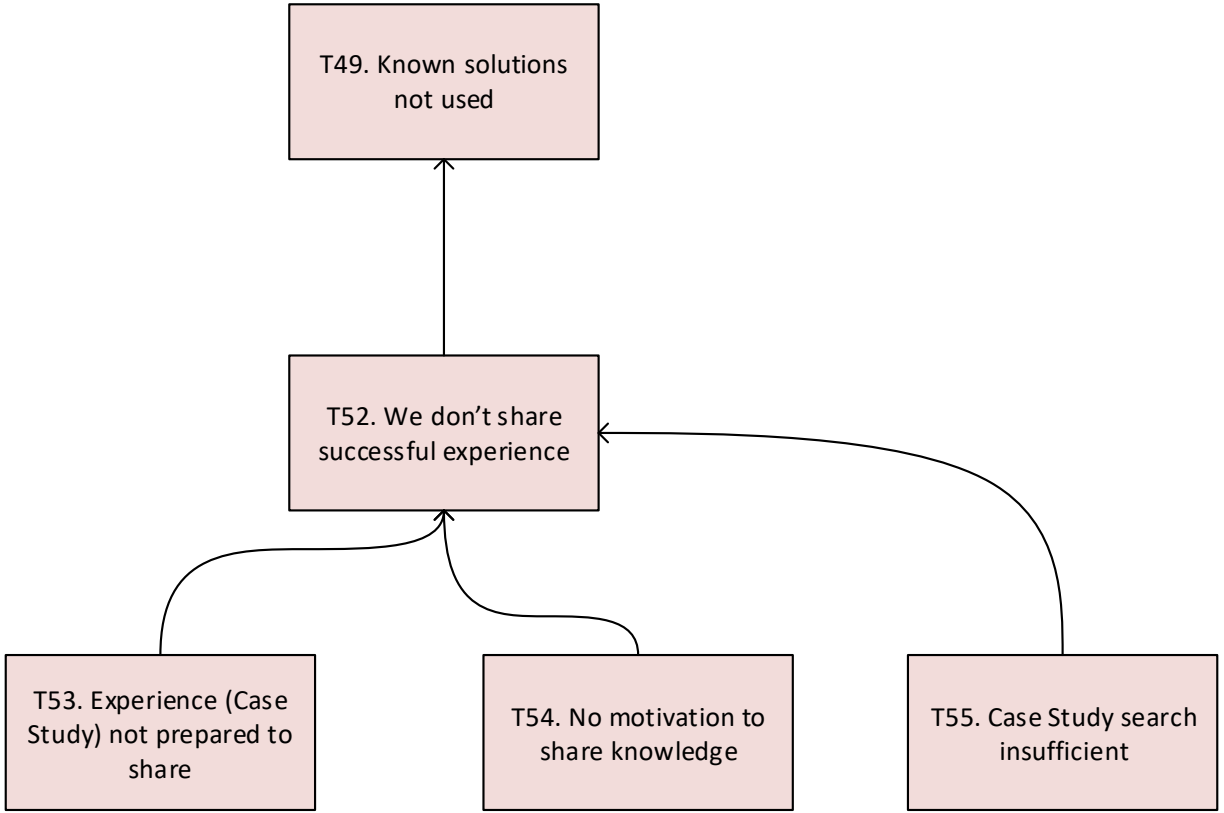
PROBLEM STATEMENT

One of the major issues is that we can't repeat success and scale it to the company level. This issue relates to both – technical and management expertise.

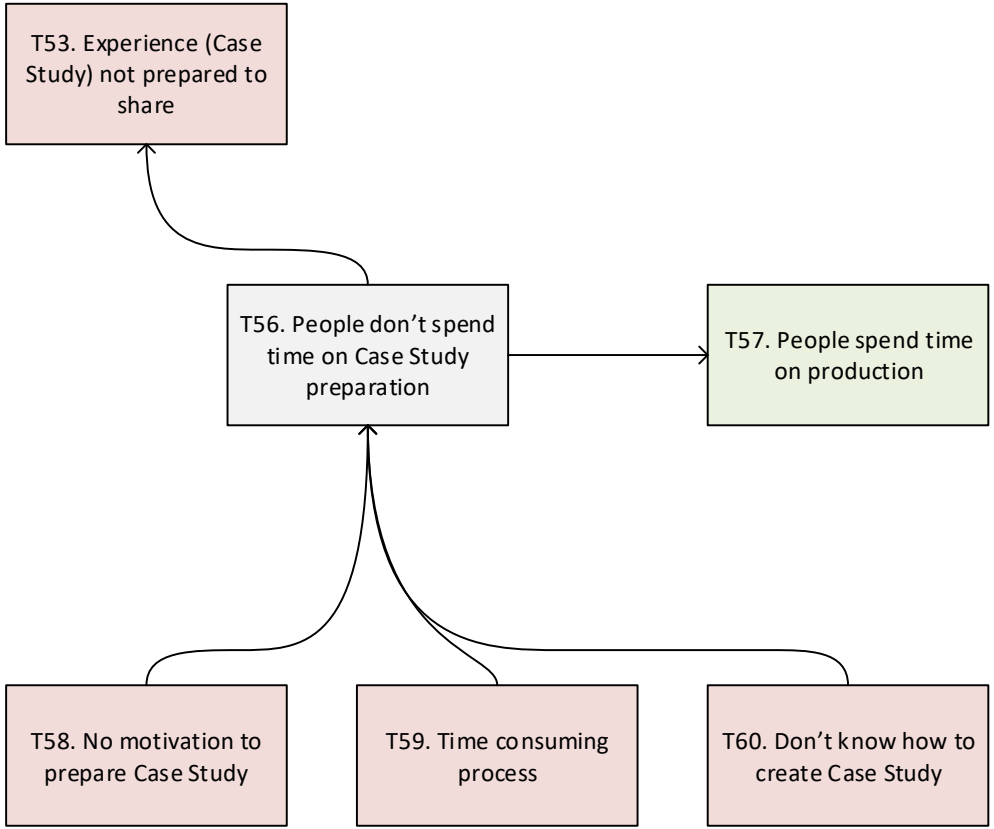
WE DON'T SHARE SUCCESSFUL EXPERIENCE (PEOPLE DON'T SPENT TIME ON BC/CS PREPARATION)

Successfully launched projects should be analyzed and case should be extracted. Technical solutions successfully implemented on the project should be announced and reviewed, but all of this requires some effort from management and development sides, also there is one more problem here is that we do not know how to perform such extraction.

RCA


T49. Known solutions not used
T52. We don’t share successful experience
T53. Experience (Case Study) not prepared to share
T54. No motivation to share knowledge
T55. Case Study search insufficient

RCA. continue



Life-cycle analysis

Solution
Successful solution
in production project

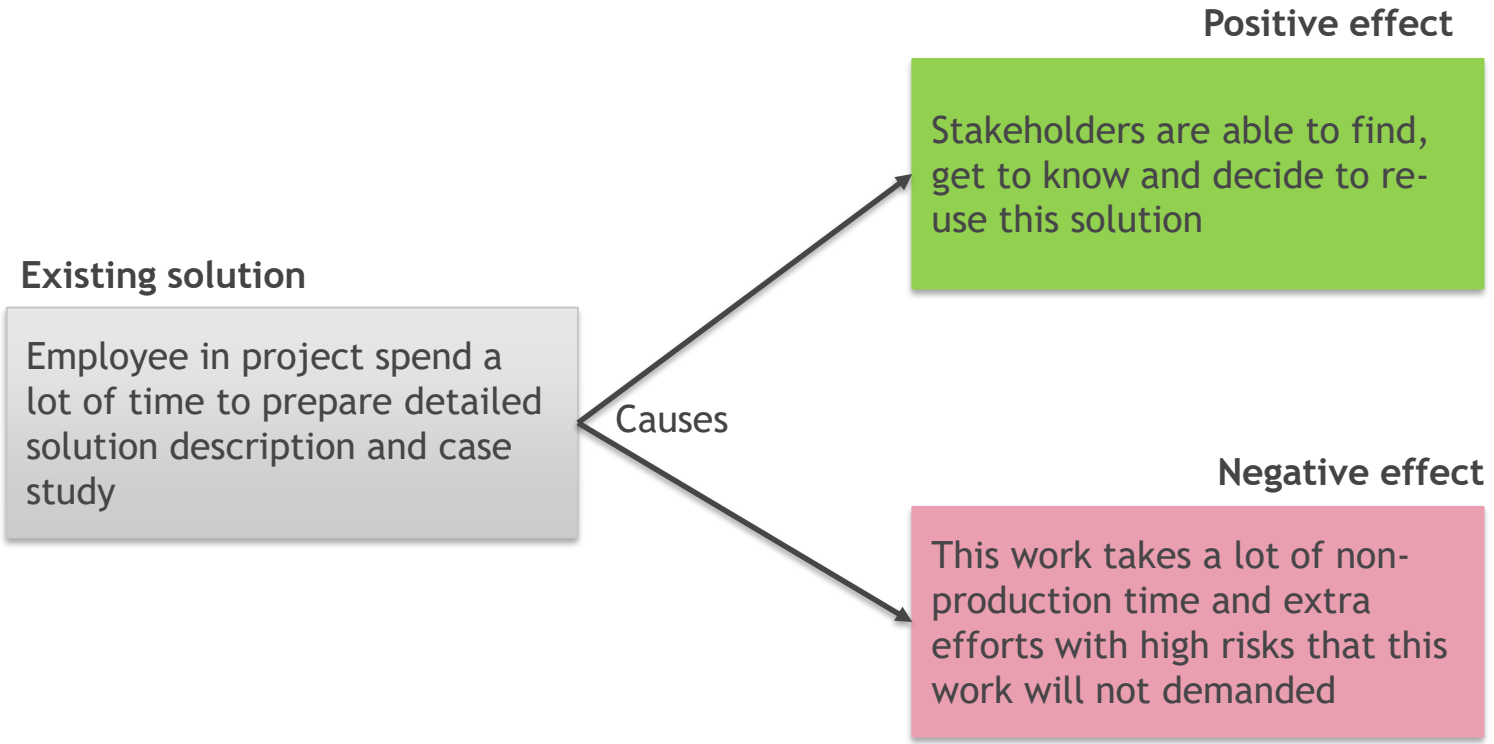
Solution receipt
Solution is interesting
for other stakeholders
(sales people, CC experts,
other PP teams and so on)

Case study
Solution can be showed to
other stakeholders
(clients, other PP teams)

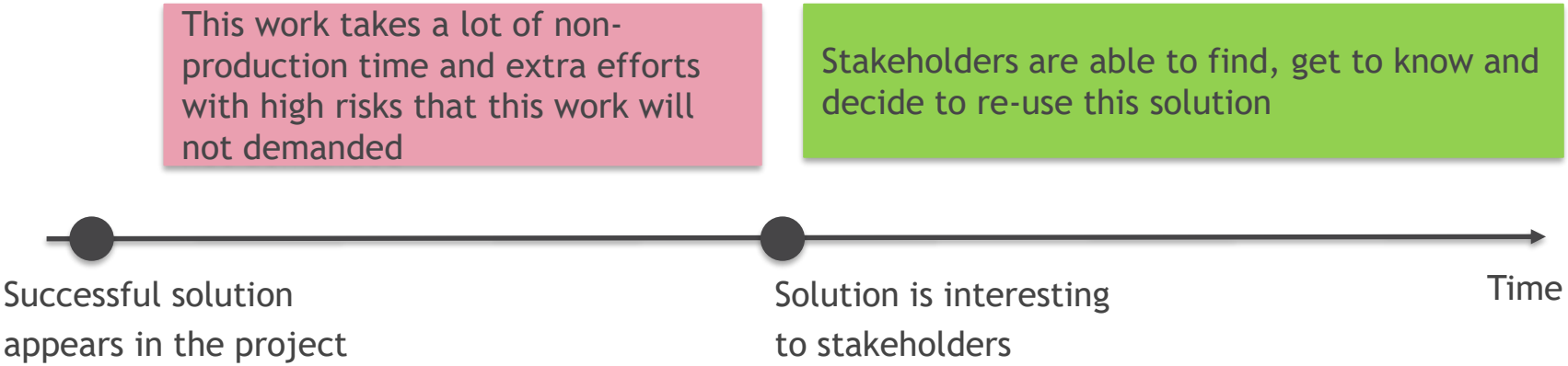
Re-usable component
Solution AS IS can be re-
used in other projects

Accelerator
Highly-scalable solution
can be used in other
projects

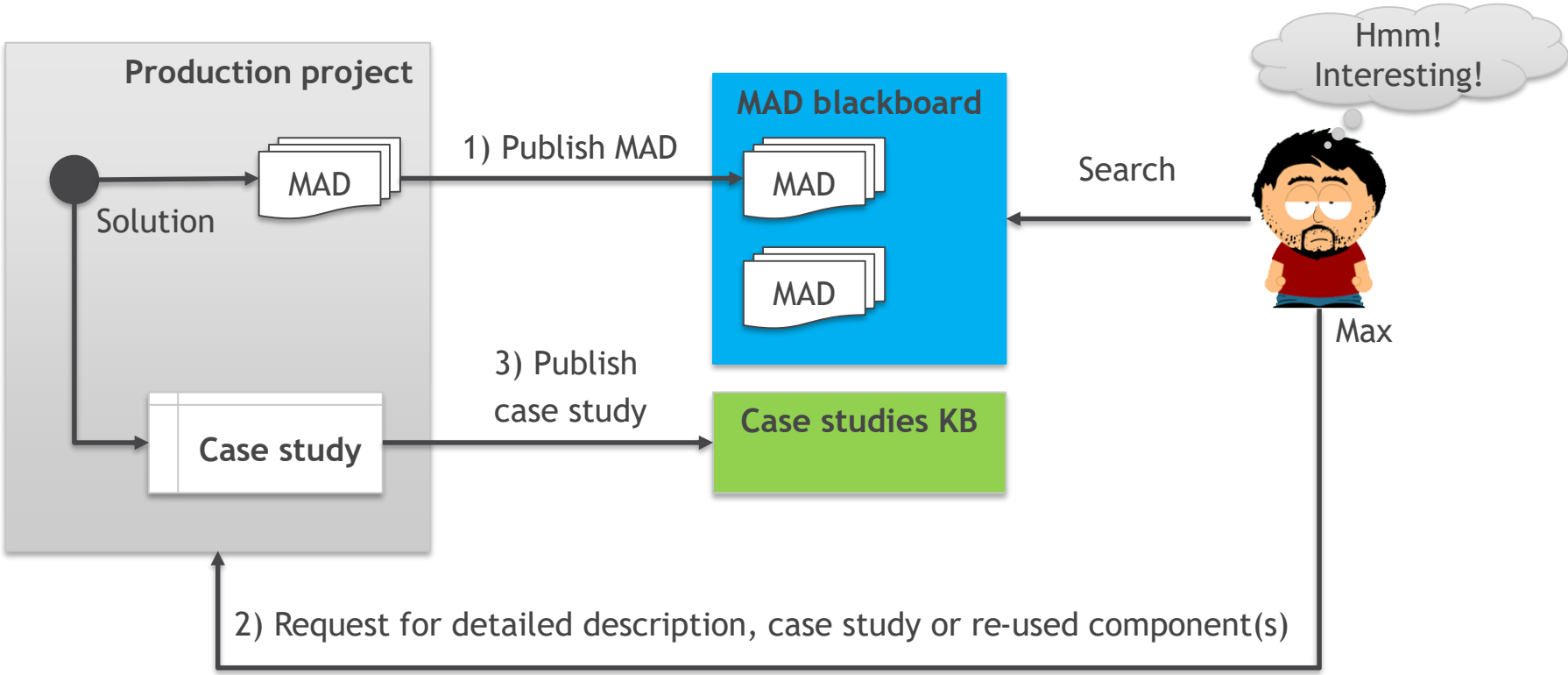
CONTRADICTION



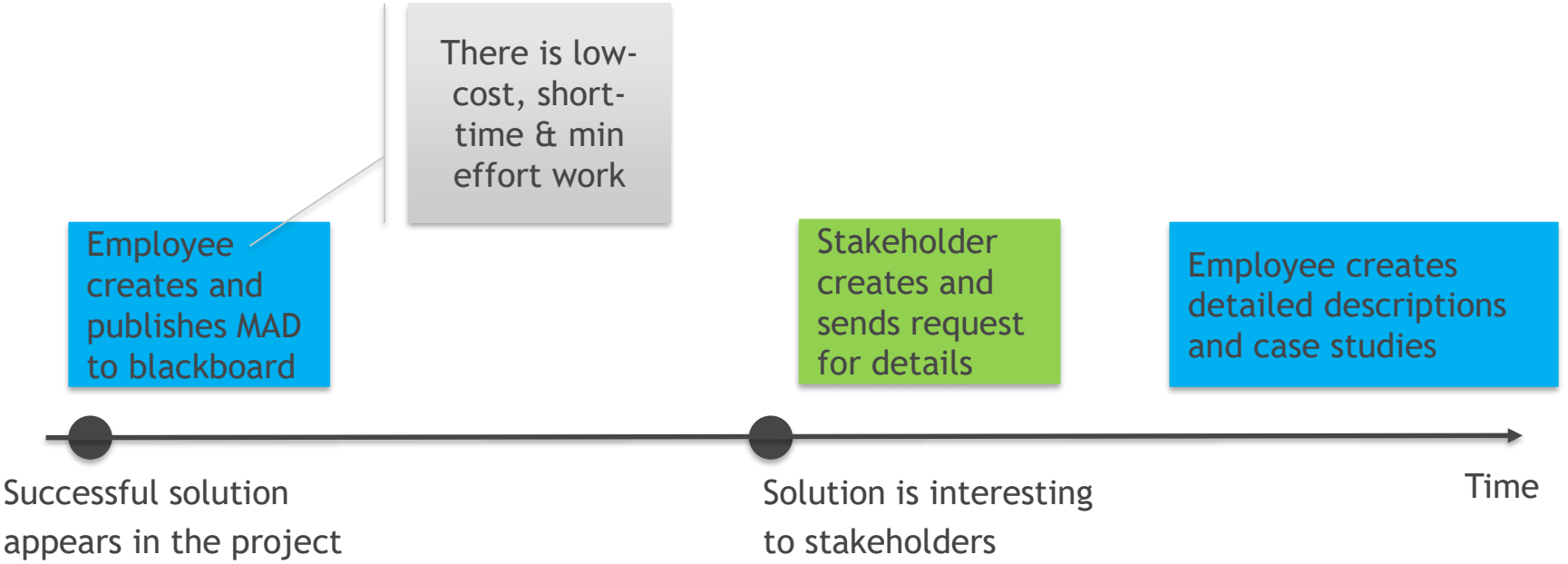
OPERATIONAL TIME ANALYSIS



NEW SOLUTION IDEA: MAD – Minimal Artefact Description



NEW OPERATIONAL TIME DIAGRAM



SOLUTION (ARTEFACT) VALUE MANAGEMENT

We can use the number of requests for details as a basic KPI to evaluate the value of solutions (artefacts) created in the production projects:

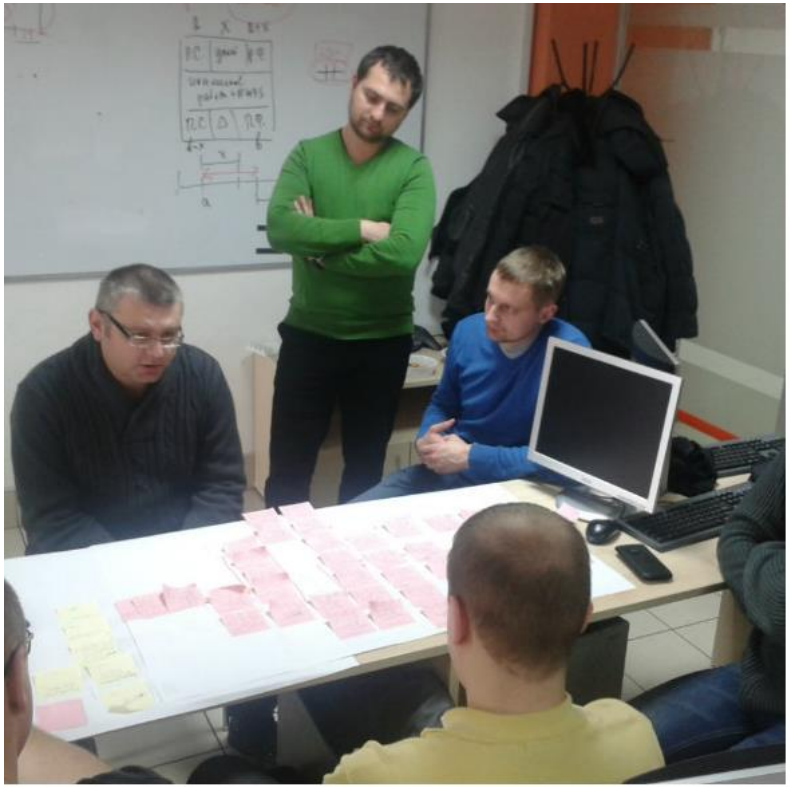
more requests for details from stakeholders means higher opportunity to scale this solution (artefact) in other projects (including pre-sale) or marketing activities

TRIZ Case Study #8

EPAM L&D (CDP) TRAINING SERVICE

1. Problem Statement. EPAM CDP provides the training services for EPAMers. The request from CDP was formulated as “how to improve the training services?”
2. Approach. Service Design + TRIZ. During Service Design stage we analyzed EPAMrs requirements to the training service, built EPAMer`s profiles, designed value propositions for them and detected gaps. List of detected gaps was an input for RCA+ analysis. On the TRIZ stage we identified the key contradictions in the current version of training service and by ARIZ-85C we identified ideal final result and generated ideas for new version of training service.
3. Results. New approach to design of EPAM training services was proposed and implemented in EPAM CDP (Minsk office). The basic idea is to transform training service to the mentoring programs that include of short theoretical sessions and long practice sessions in current projects of EPAMers. This approach is implementing in EPAM CDP (Minsk office) right now.

Situation



EPAM CDP provides training services for EPAM employees.
EPAM TRIZ team goal is to improve/design these services.

EPAMers expect to gain new skill/improve current skill as result of training. CDP often is able to offer knowledge only due to training time limitations.

EPAMer as a customer. Profile. Gains and pains

LEGEND:

Gain (for EPAMer requesting training)

Pain (for EPAMer requesting training)

Pain (for EPAMer sent to the training by manager)

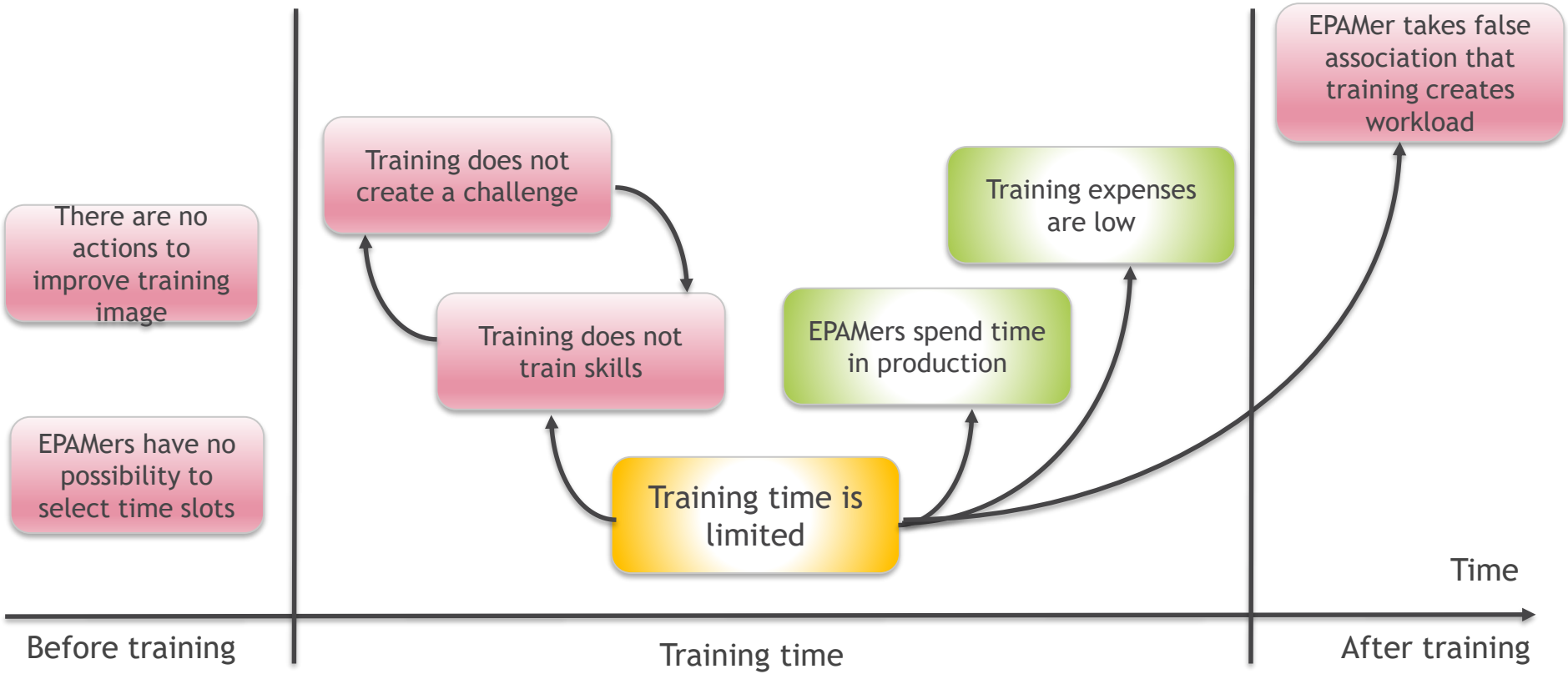
Value proposition model. Gain creators & gaps

Key Gains	Gain Creators	Detected Gap (Problem)
Get new knowledge	EPAM trainings provide knowledge	
Get new skills	No	practice to train skills are decreased to minimize training time
Saving training costs	Trainings are free for EPAMers	
Certificate	issued for programs only	
Career growth	Training records are used during assessments	
Salary growth	Training records are used during assessments	
EPAMers are interested in meeting real-life challenges during training.	No	Such challenges take a lot of training time. As a result challenges do not create in the trainings.

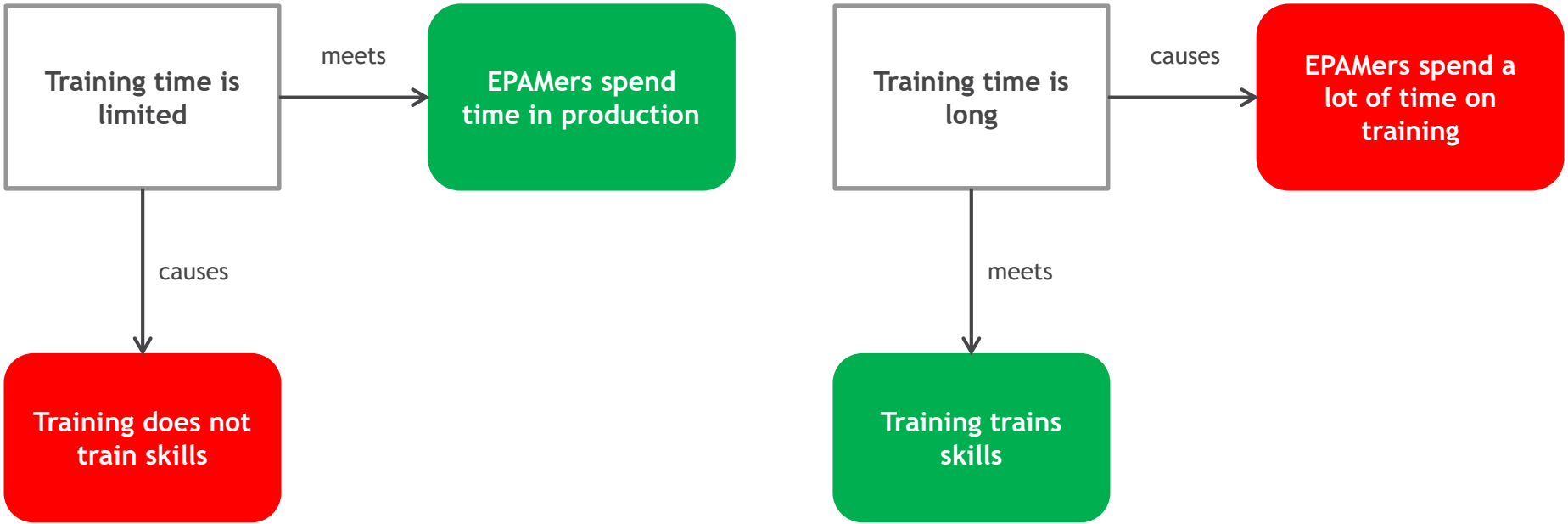
Value proposition model. Pain relievers & gaps

Key Pains	Pain Relievers	Detected Gap (Problem)
Others will become aware of my gaps	Anonymous tests before training	
Unacceptable amount of time	MOOC	
Need to meet the expectations of management	No	EPAMer takes false association that training creates workload
Training overlaps with other activities	MOOC, flexible training schedule	
Training will be difficult and it is not clear	Syllabus contains short description of the training	
Will need to learn something extra	Trainings contain links to additional knowledge sources	No support from trainer and\or experts
EPAM trainers are less competent than external	No	Training image does not improve

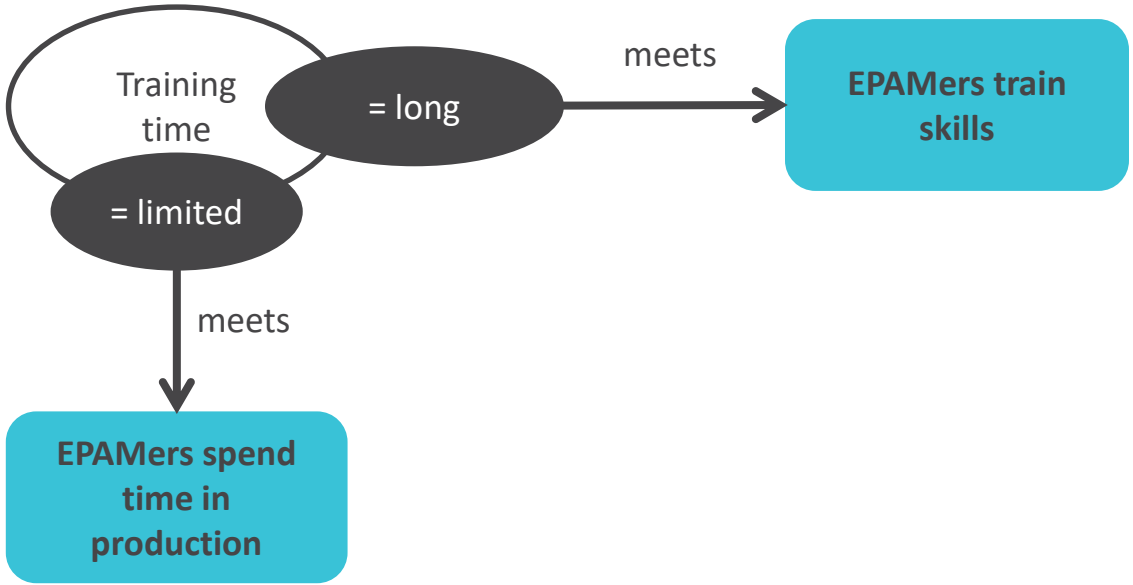
Time and root-conflict analysis



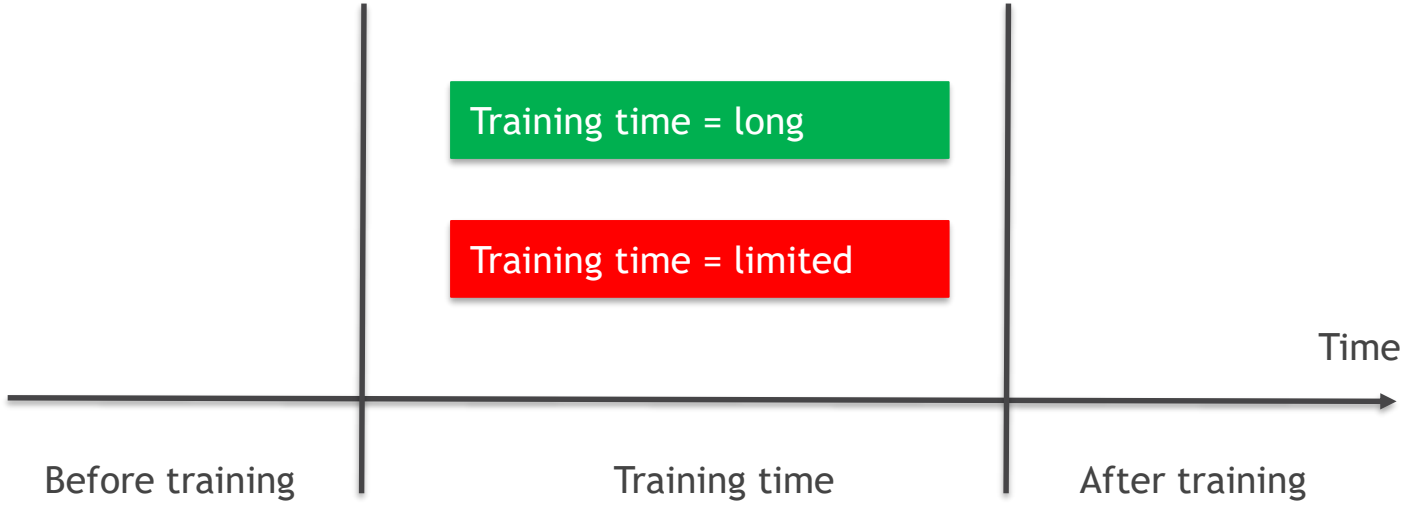
Contradiction of requirements



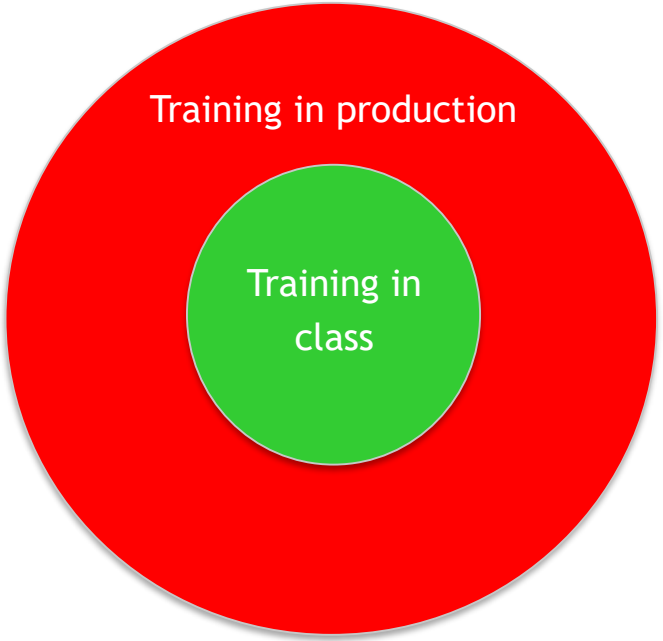
Contradiction of properties



Operational time analysis



Operational zone analysis and IFR



EPAMers need to be trained in production &
EPAMers need to be trained in classes

Ideal Final Result

Training ITSELF needs to be divided into in-class and on-the-job parts. In-class training sessions provide theoretical base and examples while skill is trained during production activities

Solution idea

CDP improves format of existing mentoring programs and promotes this format as the most effective. Mentoring program is divided into short sections where each section includes training session and mentoring session. During training session EPAMer gets knowledges. During mentoring session EPAMer supervised by mentor and solves related problem in his current production project.