eLmL/eKNOW Panel on:

ADDRESSING KNOWLEDGE AND LEARNING IN A SMART WORLD

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Bobby Gheorghiu, Canada Health Infoway, Canada
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Smart World Impacts

- Internet of everything
  - Connected everything
- Knowledge everywhere anytime
  - Including hitherto unassailable academia/scientific
  - Knowledge-centric societies
- ML and AI
  - Natural language accessibility to intelligent assistants
- Work automation
  - Job transformation and job market impacts

The era of disrupted everything?

Smart World Challenges

- V's of big data challenge knowledge/learning
- Connected, interdependent dynamic knowledge
  - Knowledge manipulation risks
- Changing user expectations
  - Postmodernism era – skeptical of truth & experts
    - Impacts on knowledge and learning

Knowledge Challenges

- Foundational challenges
- Metadata challenges
- Knowledge dynamics
- Detecting and mediating knowledge issues
- Integration and open/closed knowledge networks
- Knowledge ownership and governance, defense, packaging, sharing, metrics, crowd-vetting

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Continuous disruption of knowledge!

Learning Challenges

- A smart world changes how we learn: accessible knowledge
- Knowledge in certain areas rapidly changing
- Academia-orientation: discipline applicability to teaching for a highly dynamic job market
- Adaptive learning models
- Partial knowledge of human learning state
- Learning standardization in the postmodern age

Learning Challenges

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Continuous disruption of learning!

Thank

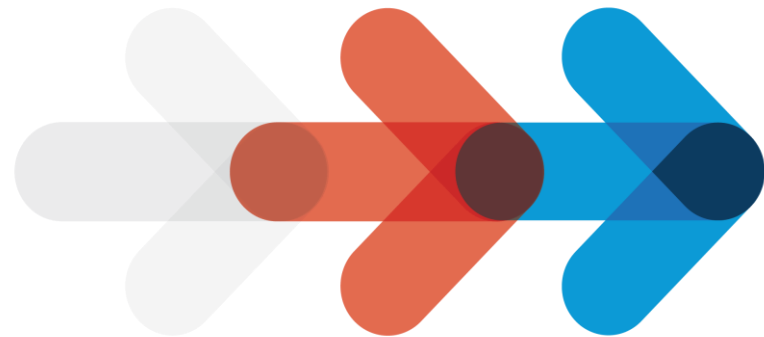Welcome to the era of disruption.

Enjoy your next disruption!

you

Addressing Knowledge/ Learning in a Smart World

DigitalWorld 2017
Nice, France

Insights about health care and the role of digital health from the perspective and experience of Canadians
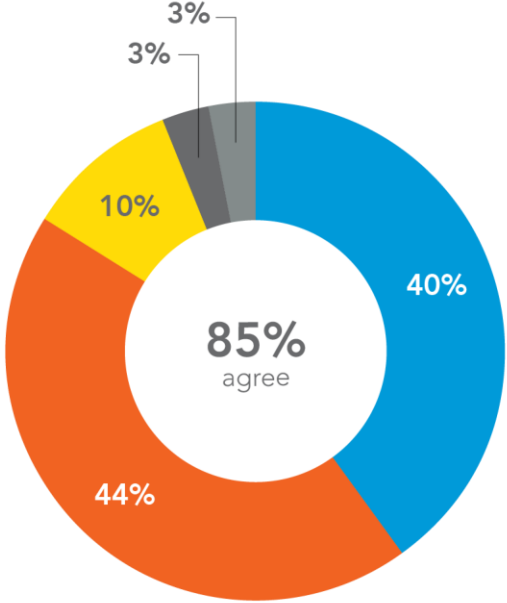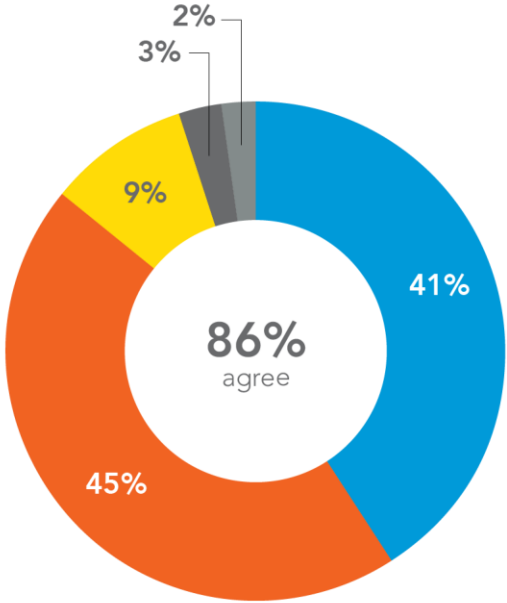
ABOUT THIS REPORT

- This is a summary of digital health perspectives of more than 6,000 adult Canadians collected over three years from four public opinion surveys. Findings explore the level of awareness, understanding and perceived benefits of digital health, as well as current access and use of these services in Canada.

- The public opinion research studies used for this report have been commissioned by Canada Health Infoway (Infoway). Infoway regularly conducts public opinion surveys with Canadians as part of its commitment to listen to their perspectives and understand their needs.

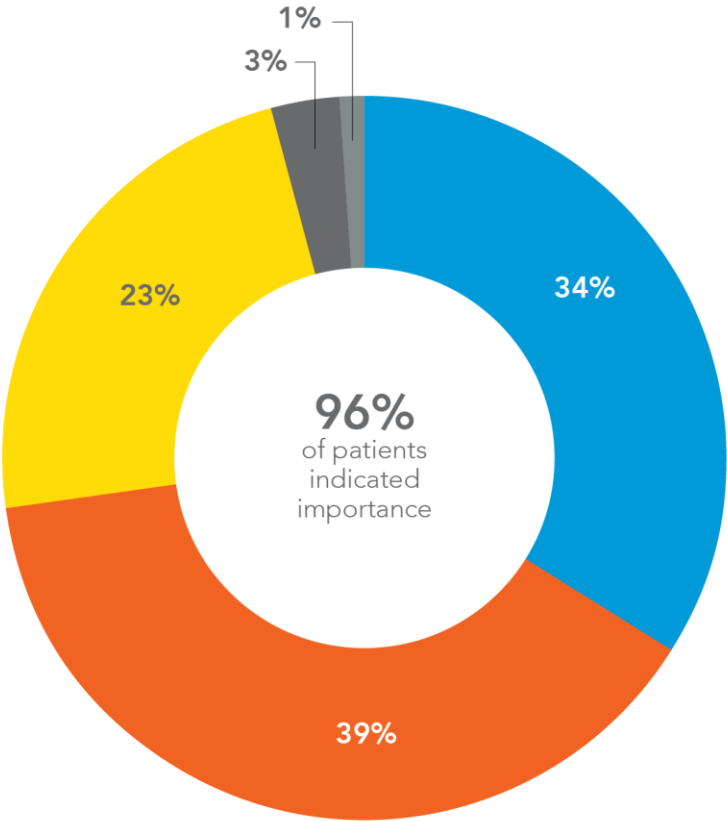# Level of agreement about how digital health helps health care providers[1]

Ensuring health care providers have easy access to a comprehensive picture of patients' health histories

86% agree

41% — 7 - Strongly agree
45% — 5, 6
9% — 4 - Neither agree nor disagree
3% — 1, 2, 3 - Disagree
2% — Don't know

Helping coordinate care between multiple health care providers

85% agree

40% — 7 - Strongly agree
44% — 5, 6
10% — 4 - Neither agree nor disagree
3% — 1, 2, 3 - Disagree
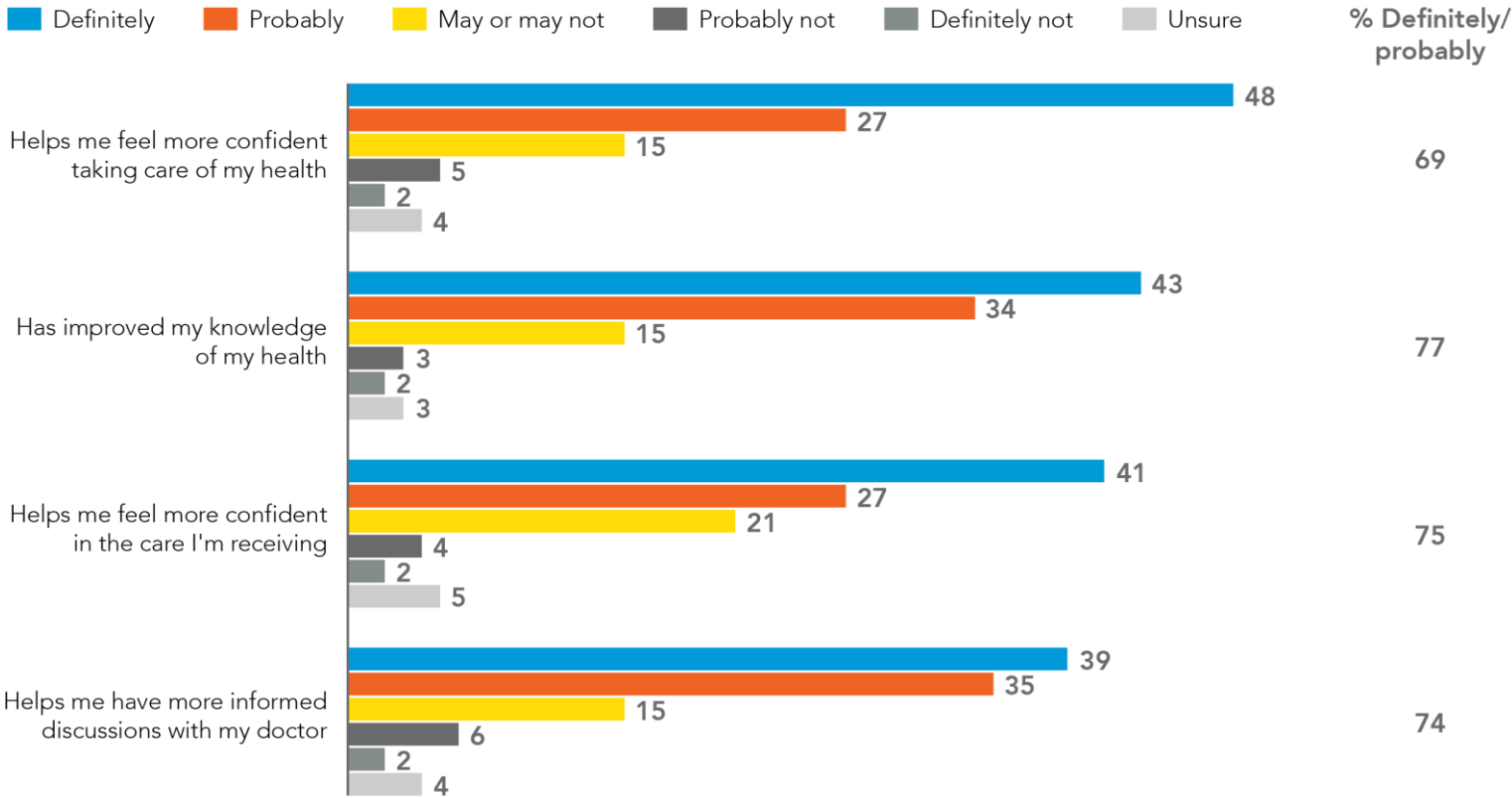3% — Don't know

Legend: 7 - Strongly agree | 5, 6 | 4 - Neither agree nor disagree | 1, 2, 3 - Disagree | Don't know

Importance for health records to be kept electronically so that they can be transferred within the health system


96% of patients indicated importance

- 34% — Extremely important
- 39% — Very important
- 23% — Somewhat important
- 3% — Not very important
- 1% — Not at all important

Legend: Extremely important | Very important | Somewhat important | Not very important | Not at all important

Canada Health Infoway | Inforoute Santé du Canada

Benefits of online access to health information or services[2]

Legend: Definitely · Probably · May or may not · Probably not · Definitely not · Unsure

% Definitely/ probably

Helps me feel more confident taking care of my health
- Definitely: 48
- Probably: 27
- May or may not: 15
- Probably not: 5
- Definitely not: 2
- Unsure: 4
- % Definitely/probably: 69

Has improved my knowledge of my health
- Definitely: 43
- Probably: 34
- May or may not: 15
- Probably not: 3
- Definitely not: 2
- Unsure: 3
- % Definitely/probably: 77

Helps me feel more confident in the care I'm receiving
- Definitely: 41
- Probably: 27
- May or may not: 21
- Probably not: 4
- Definitely not: 2
- Unsure: 5
- % Definitely/probably: 75

Helps me have more informed discussions with my doctor
- Definitely: 39
- Probably: 35
- May or may not: 15
- Probably not: 6
- Definitely not: 2
- Unsure: 4
- % Definitely/probably: 74

Among Canadians who have accessed consumer digital health services (email, web services, and/or virtual video visit), extent to which they agree or disagree to the above statements
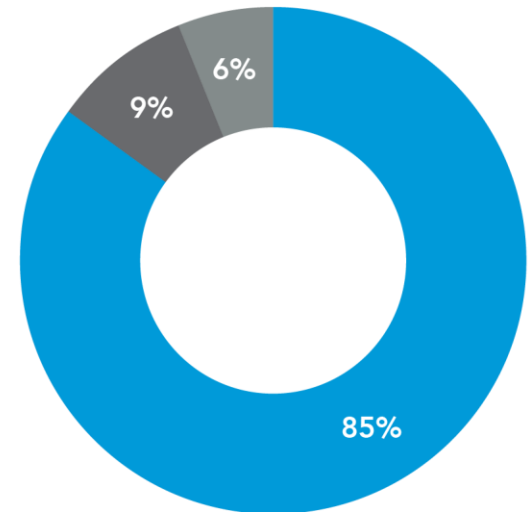
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Use of a digital fitness/health tracker[1]
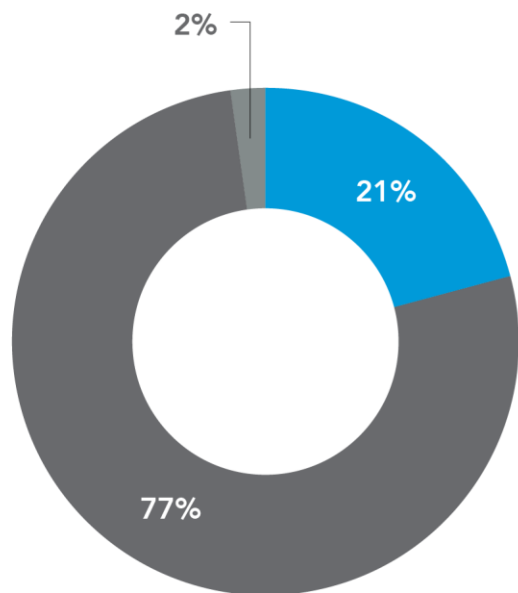
Previously shared data from digital fitness/health tracker[1]
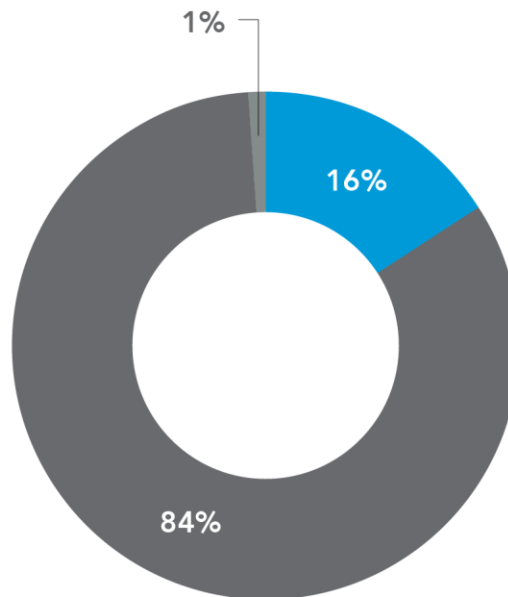
Willingness to share data from digital fitness/health tracker[1]

2%
21%
77%

1%
16%
84%

6%
9%
85%

Yes   No   Don't know

Canada Health Infoway   Inforoute Santé du Canada

REASONS FOR USING DIGITAL FITNESS/HEALTH TRACKERS

Reason	Percentage
To help get fit or be healthier	45%
I was curious	43%
Fitness training tool	37%
To help me keep track of my health indicators (such as heart rate, blood pressure)	22%
My family/friends encouraged me to use one	17%
My doctor recommended it	6%
Other	7%
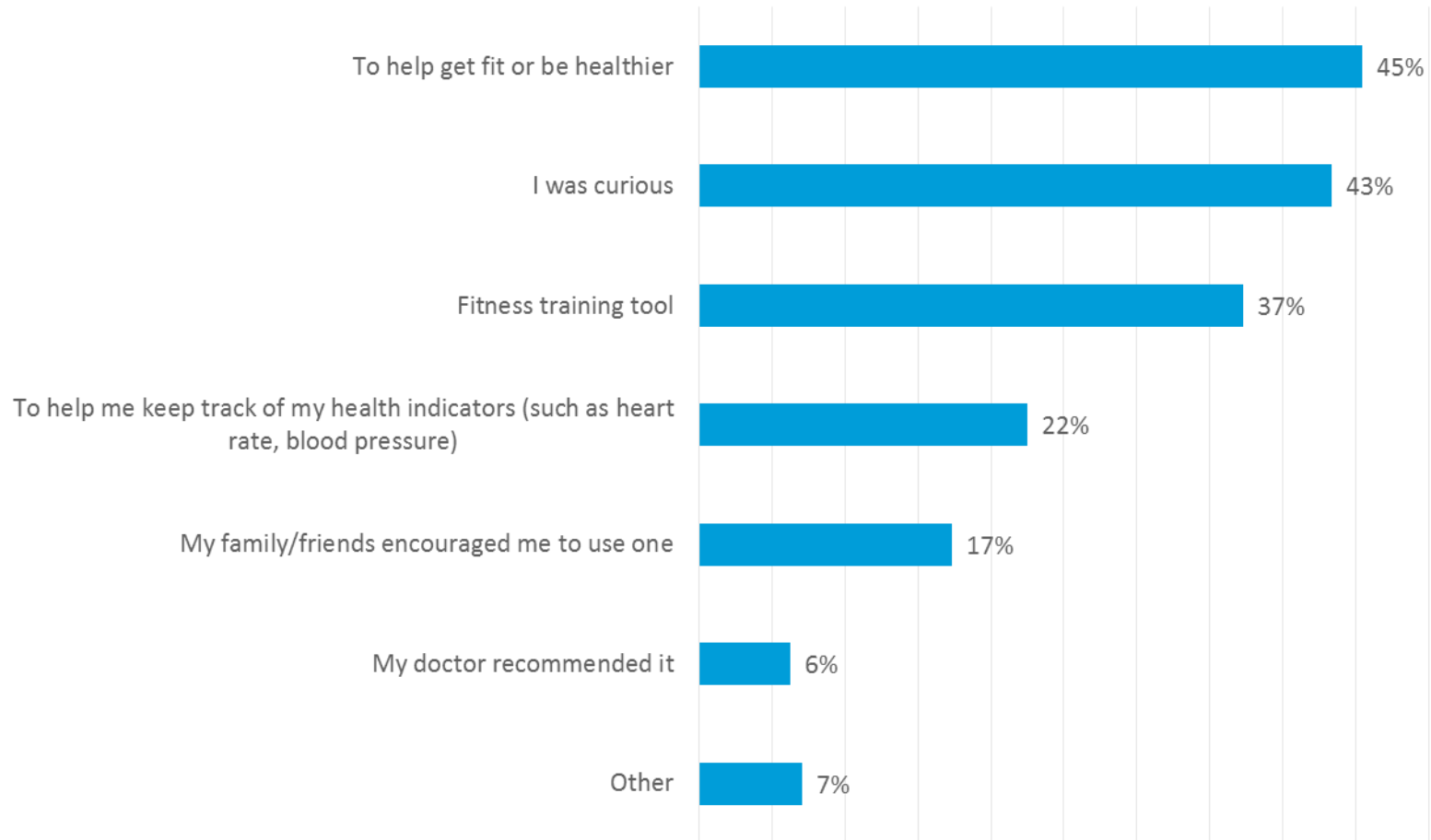
Q25. Why did you start using it?
Base: Respondents who use or have used a digital fitness or health tracker (n=433)

INTEREST IN DIFFERENT DIGITAL HEALTH BEHAVIOURS

Among those who <u>do not</u> access to specific digital health service OR <u>have not</u> accessed specific digital health service if it was available.

Legend: ■ Yes ■ No ▧ Don't know ▦ N/A

Behaviour	Yes	No	Don't know	N/A
Send a request electronically for a prescription renewal (n=1,813)	70%	16%	11%	3%
View a list of your current prescriptions and medication history electronically (n=1,814)	70%	16%	12%	3%
Access your own medical records electronically (n=1,826)	69%	16%	12%	3%
View immunization records electronically (n=1,898)	69%	15%	12%	4%
View your laboratory test results electronically (n=1,729)	68%	17%	12%	3%
Make an appt. with your regular doctor or place of care electronically, for example, on a secure website (n=1,839)	67%	18%	12%	3%
Consult with any of your health care providers online without having to phone or visit their office (n=1,893)	55%	25%	17%	2%
Visit with your health care provider virtually online by video (n=1,930)	36%	40%	20%	4%

Q19. For each of the following please indicate whether or not you LIKE TO be able to securely access this type of health information or service **electronically/online**
Base: Respondents with no current access to health provider electronically or have not accessed it within the past year (base sizes vary)
* Please note: Due to programming differences, this question is not trackable to previous years.

PREFERENCE OF DEVICE TO ACCESS DIGITAL HEALTH SERVICES

Device	Percentage
Laptop computer	58%
Desktop computer	54%
Smartphone	38%
Tablet	33%
N/A	7%
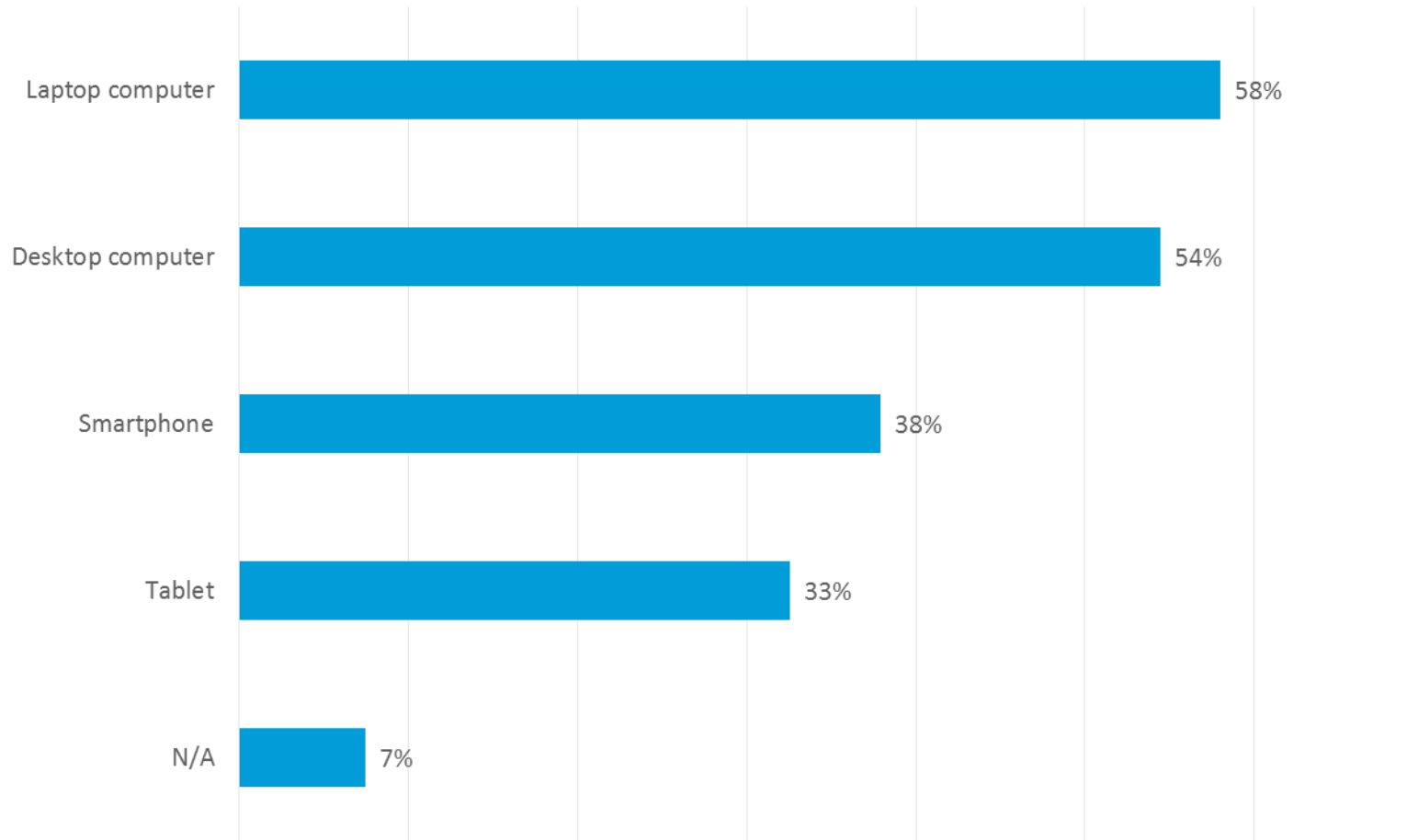
Q20. What type(s) of device(s) would you use or have you used to access these services?
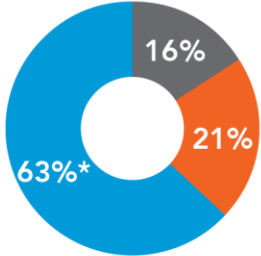Base: All respondents (n=1,982)

Access to digital health services and perspectives on privacy and security of health information[2]

% of Canadians that say any concerns about the privacy and security of their electronic health information are outweighed by their desire to have access to their health information online

2%
17%
25%
56%

Has current access to set of digital health services

16%
21%
63%*

Has NO current access to set of digital health services

19%
28%
54%

■ Agree ■ Disagree
■ Neither agree/disagree (indifferent) ■ Don't know
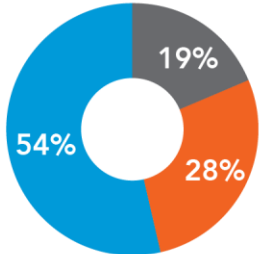
Statistically significant at p < 0.05

Canada Inforoute
Health Santé
Infoway du Canada

THANK YOU!

Some Aspects of Knowledge Work
Panel: Addressing Knowledge/Learning in a Smart World
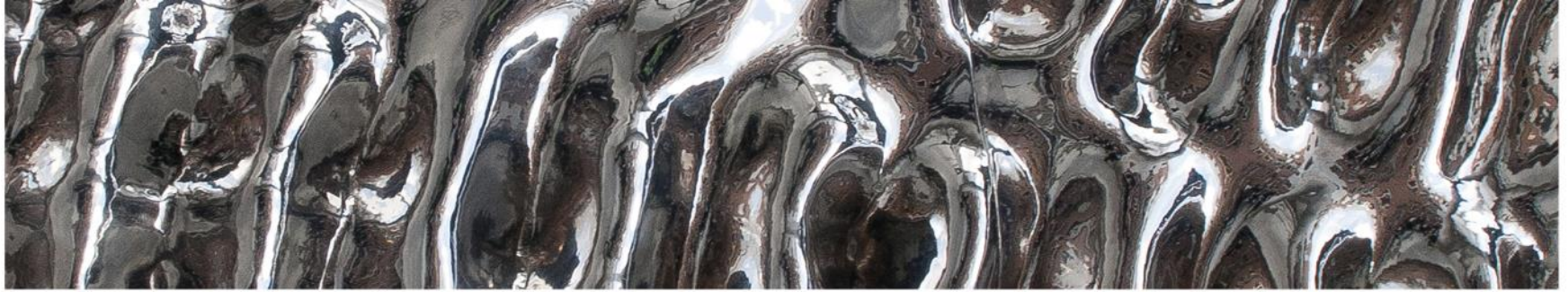
Guri Verne

Department of Informatics, University of Oslo

Norway

Case: The Tax Authorities' Call Centre

The call advisors' knowledge work (Verne 2015)

Knowledge can be

- time critical

- emergent and socially distributed
    - Not known in advance what is needed
    - Knowledge from many people is necessary

- both local and general

    (Normark & Randall 2005)

Information and its production and use must be considered together

    (Ackerman et al. 2013)

Tax rules and regulations

- Laws

- Rules

- Regulations

- Procedures

- Also

  – Conventions and local practices

  – Practices of other public agencies

  – Online services

The advisors' knowledge representations

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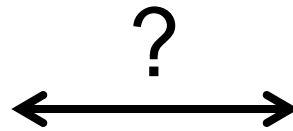
«Diagnosing» - understanding the question
- The caller may ask «the wrong question»
Matching the question with potential answers

Guri Verne: Some Aspects of Knowledge Work

No easy corre-spondence

Kapittel 6. Alminnelig inntekt - fradrag
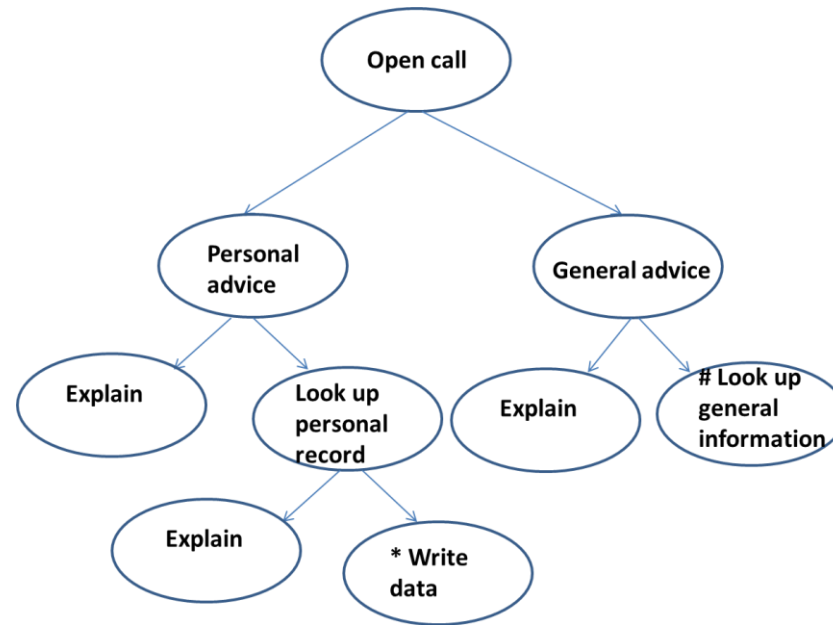
Choices advisors make during a call.

Informal knowledge is important

The citizen needs to make meaning of the advicer's answers.
The advisor needs to understand the citizen's issues.

The advisors are
    helping the citizen to understand the tax rules and system
    helping them to match the rules with their own life situation

Meeting the citizens where they are (Verne 2014):
    Long explanations or short replies when needed
    Teaching do-it-yourself when possible
    Calm anger
    Deflecting critique they cannot help
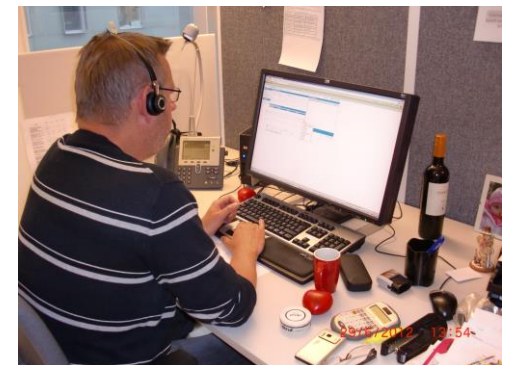
References

Mark S. Ackerman, Juri Dachtera, Volkmar Pipek, Volker Wulf (2013) Sharing Knowledge and Expertise: The CSCW View of Knowledge Management, Journal of Computer Supported Cooperative Work, Volume 22 Issue 4-6, August, pages 531-573

Normark, M. & Randall, D. (2005) Local Expertise at an Emergency Call Centre, in: H. Gellersen et al. (eds) Proceedings of the 9th European Conference on Computer-Supported Cooperative Work, Paris

Verne, G. (2015) The winners are those who have used the old paper form. On citizens and automated public services, PhD Thesis, University of Oslo, 2015, http://urn.nb.no/URN:NBN:no-50321.

Verne, G. (2014) Two faces of autonomy. Learning from non-users of an e-service, Systems, Signs and Actions, 8 (1) Special issue on "Government - citizen communication through the web"
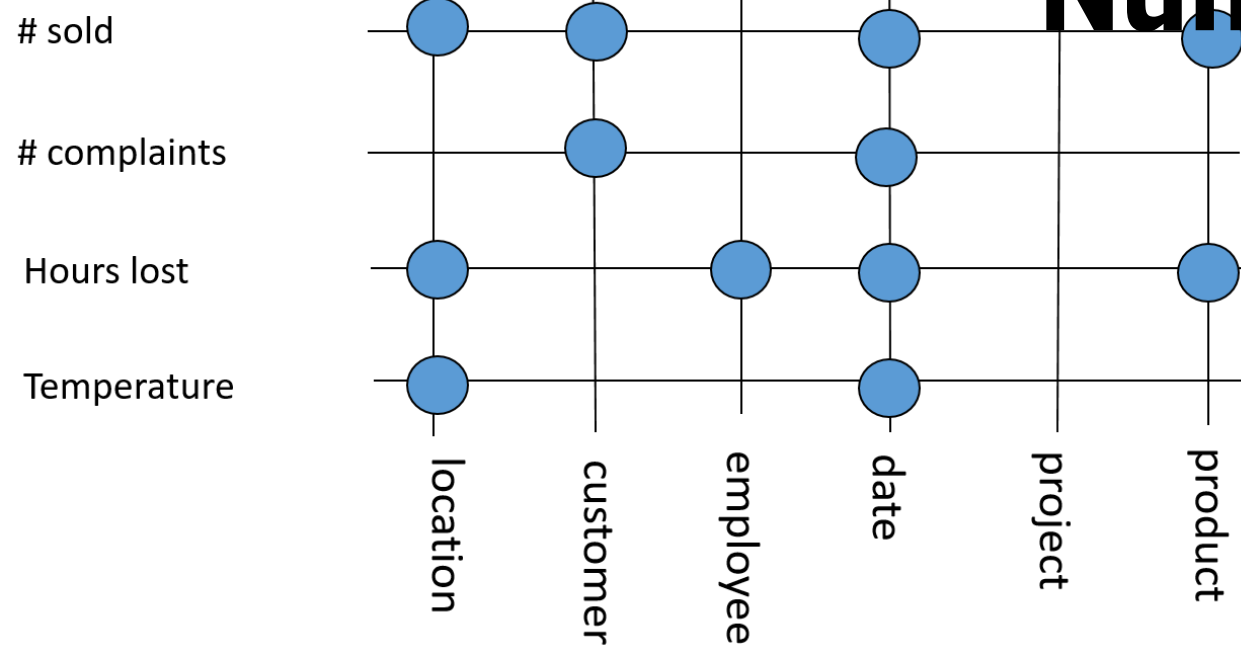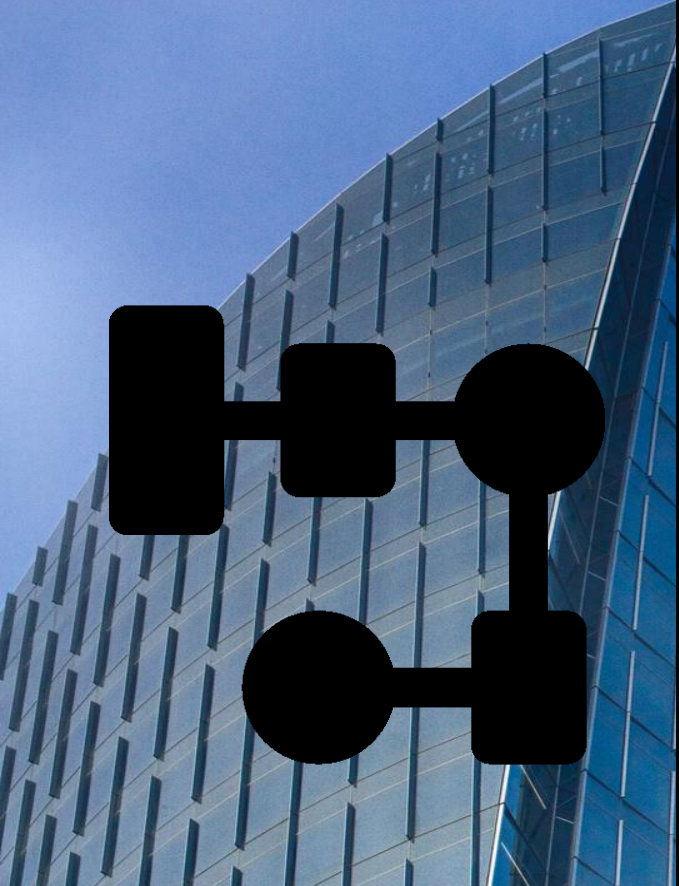
Thank you!

Decision Mining

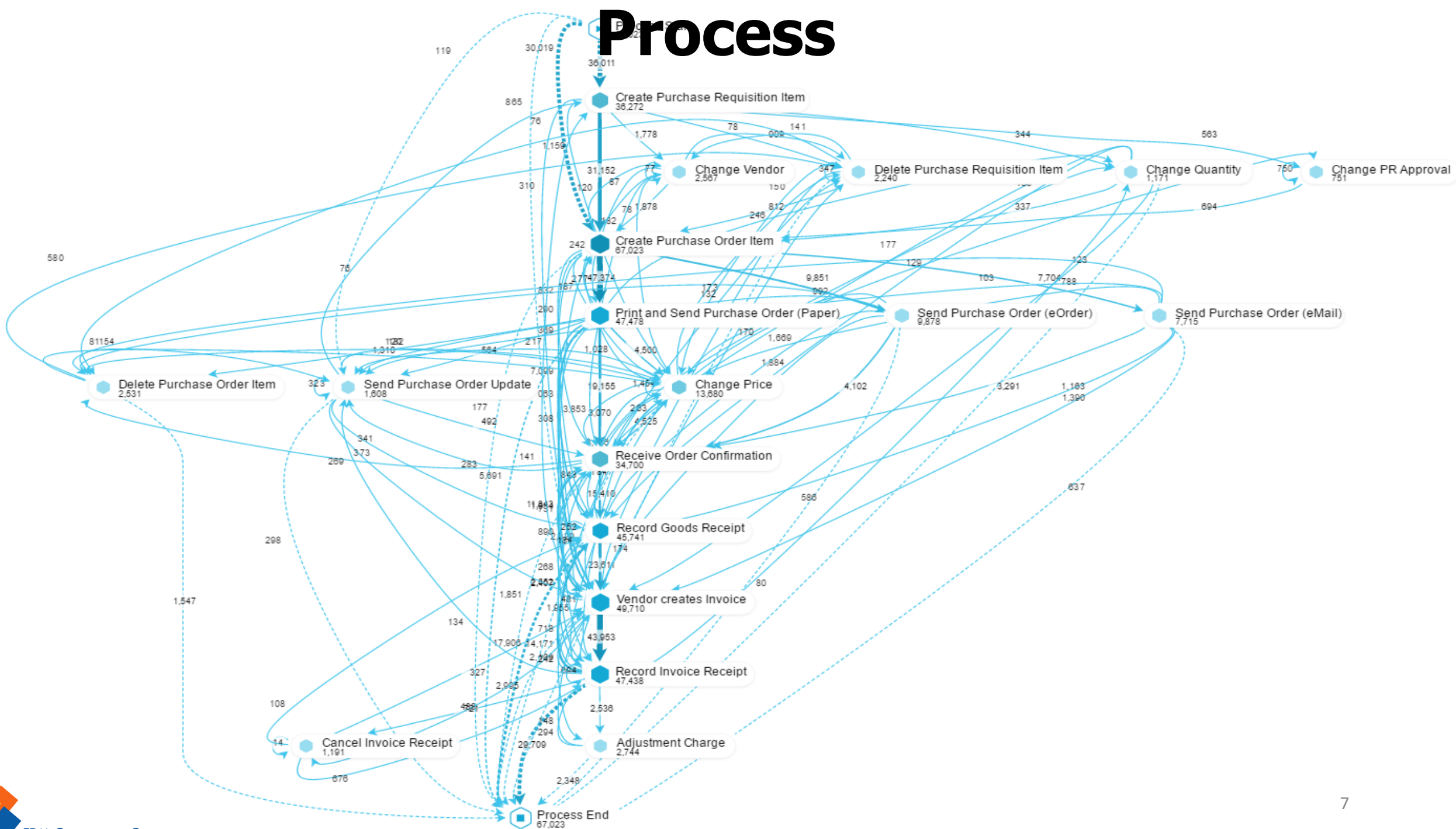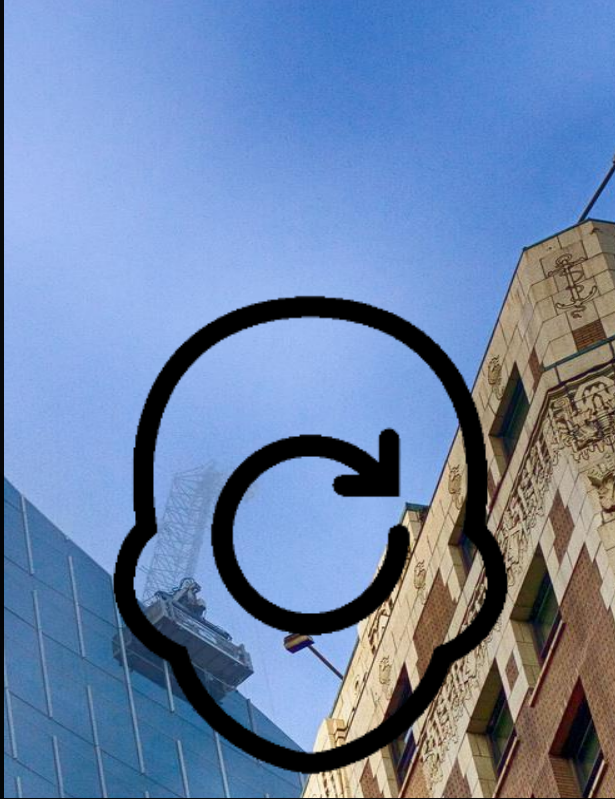**Prof. Dr. Martijn Zoet**

Numbers

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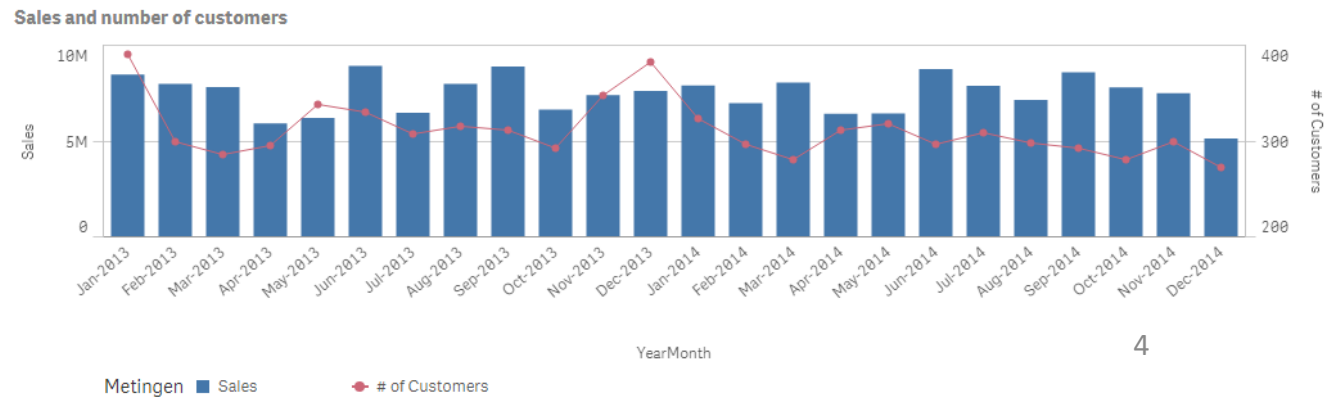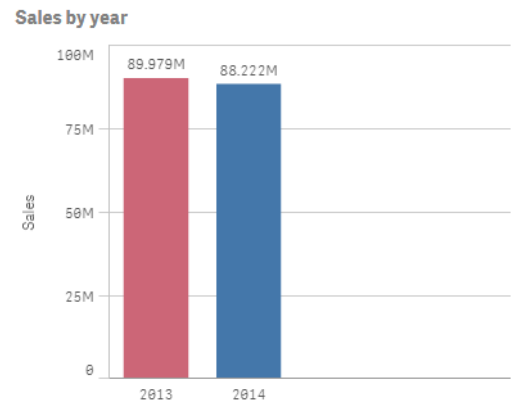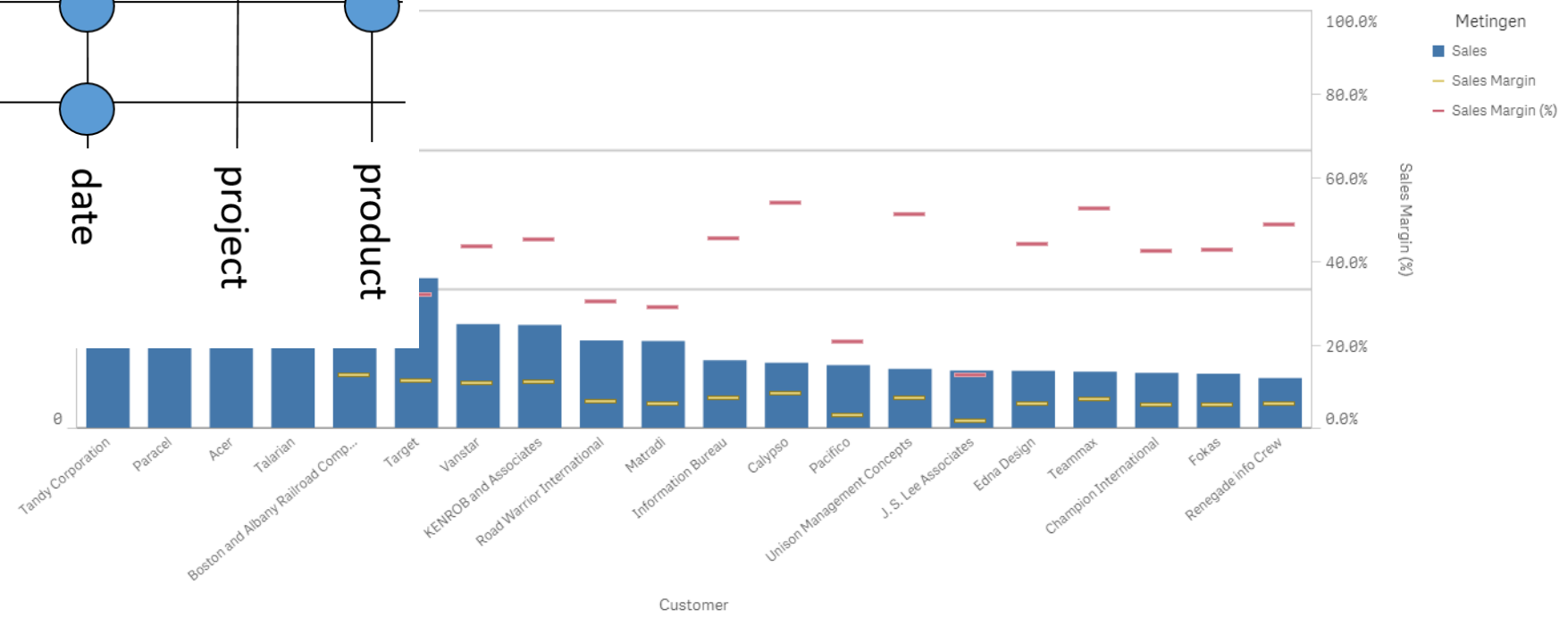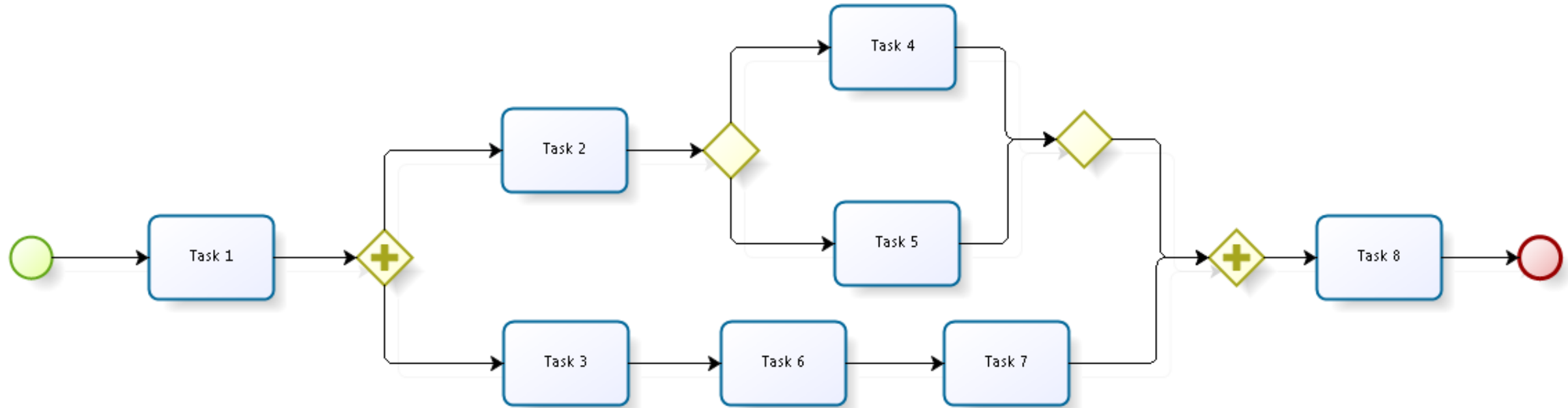
Process

Process

Decisions
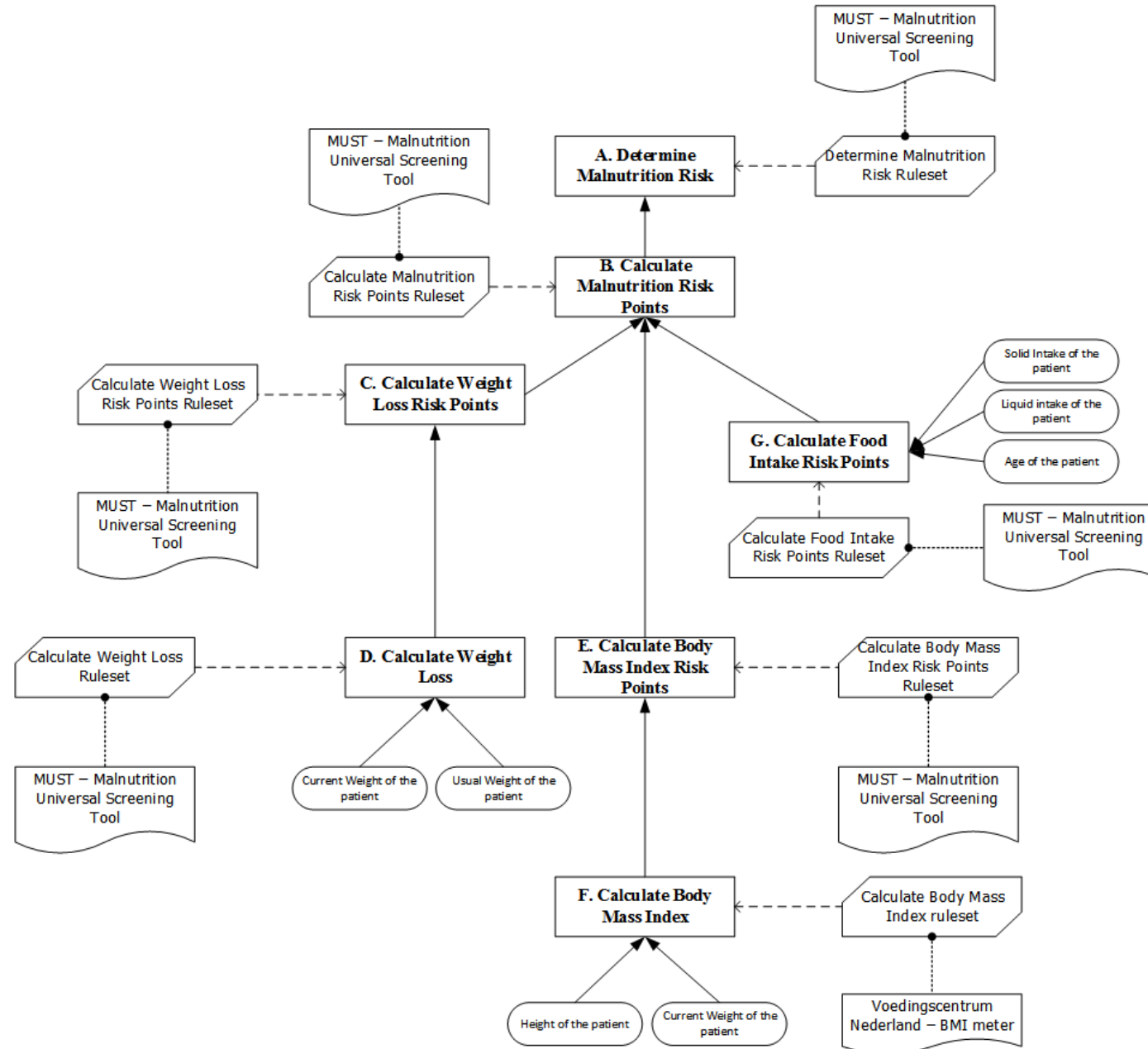
Decisions

Calculate Food Intake Risk Points

U	Input +			Output +	
	Solid Intake of the patient	Age of the patient	Liquid Intake of the patient	Food Intake Risk Points of the patient	Annotation
	integer	integer	integer	integer	
1	<= 5	<= 18	<= 1	0	Food Intake Risk Points of the patient is 0
2	<= 5	> 18	<= 1	2	Food Intake Risk Points of the patient is 2
3	<= 5	> 18	> 1	4	Food Intake Risk Points of the patient is 4
4	> 5	> 18	> 1	6	Food Intake Risk Points of the patient is 6
5	> 5	<= 18	> 1	4	Food Intake Risk Points of the patient is 4
6	> 5	> 18	<= 1	4	Food Intake Risk Points of the patient is 4

G. Calculate Food Intake Risk Points

BR13 - Food Intake Risk Points of the patient must be equated to 0 IF Solid Intake of the patient <= 5 days AND Age of the patient <= 18 AND Liquid Intake of the patient <= 1 days

BR14 - Food Intake Risk Points of the patient must be equated to 2 IF Solid Intake of the patient <= 5 days AND Age of the patient > 18 AND Liquid Intake of the patient <=1 days

BR15 - Food Intake Risk Points of the patient must be equated to 4 IF Solid Intake of the patient <= 5 days AND Age of the patient > 18 AND Liquid Intake of the patient > 1 days

BR16 - Food Intake Risk Points of the patient must be equated to 6 IF Solid Intake of the patient > 5 days AND Age of the patient > 18 AND Liquid Intake of the patient > 1 days
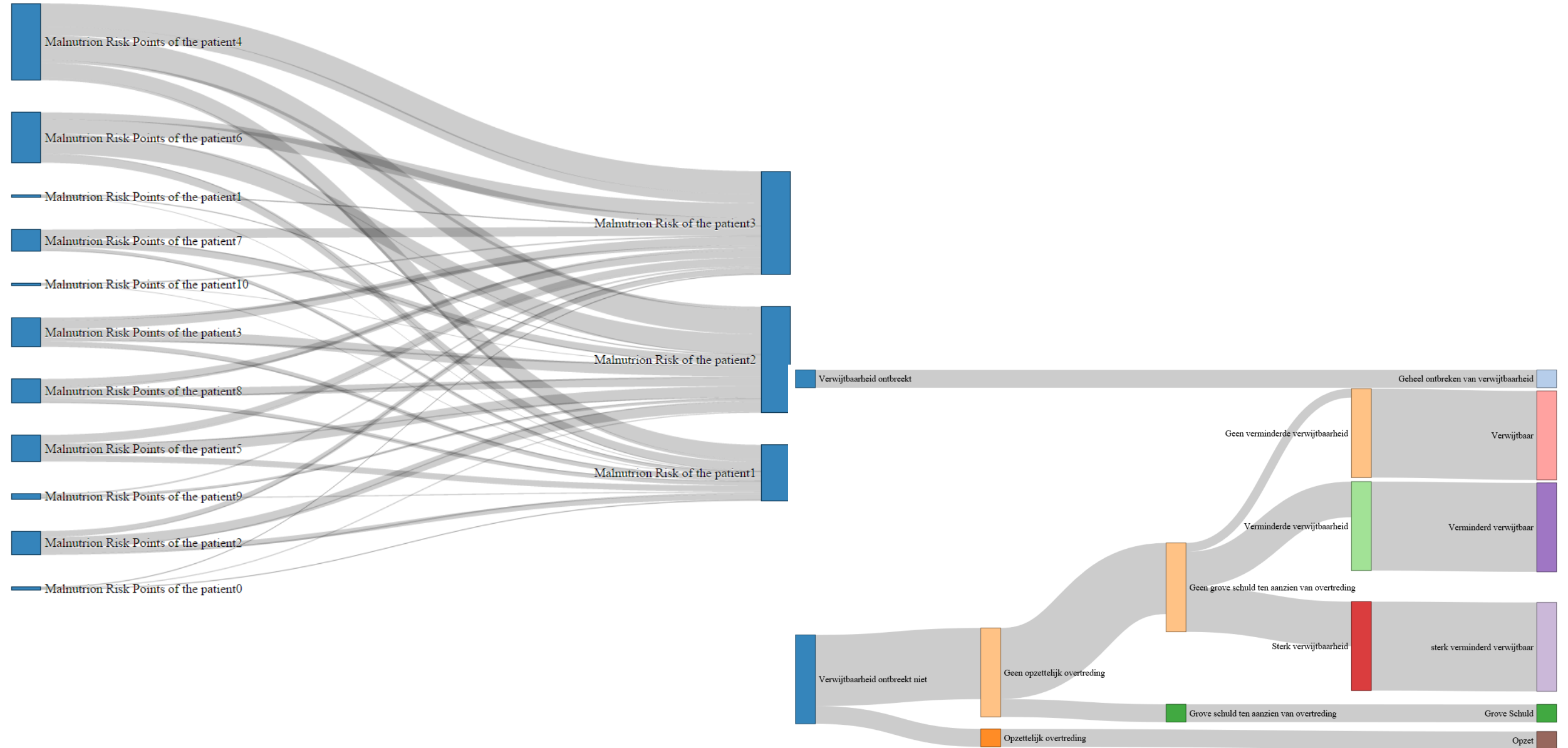
BR17 - Food Intake Risk Points of the patient must be equated to 4 IF Solid Intake of the patient > 5 days AND Age of the patient <= 18 AND Liquid Intake of the patient > 1 days
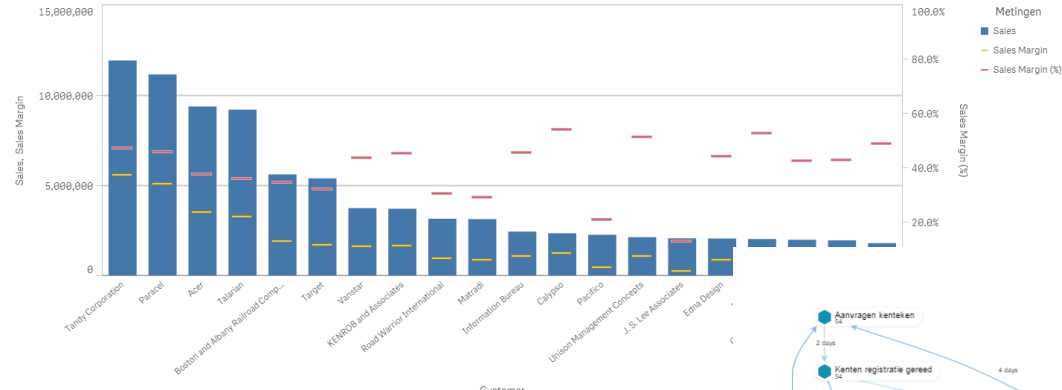
BR18 - Food Intake Risk Points of the patient must be equated to 4 IF Solid Intake of the patient > 5 days AND Age of the patient > 18 AND Liquid Intake of the patient <= 1 days
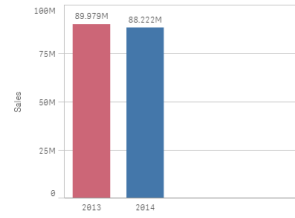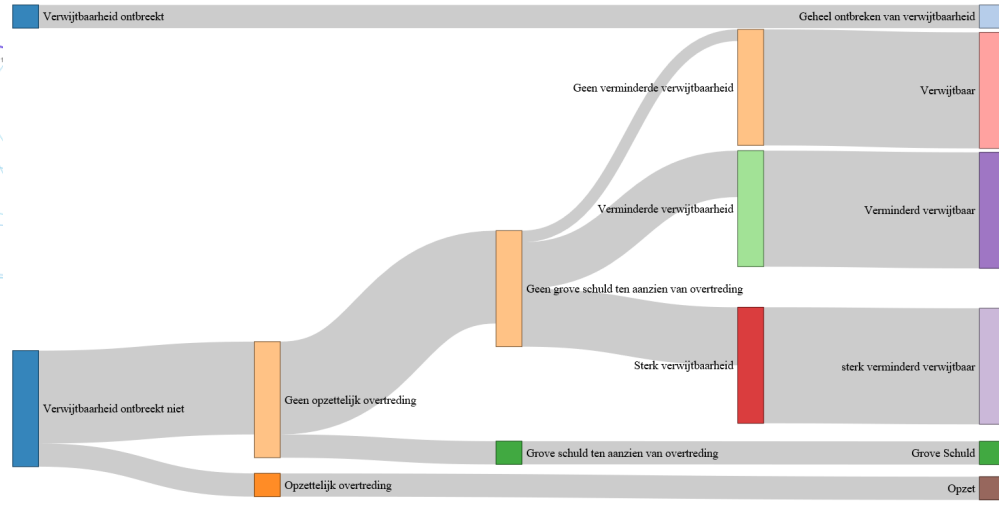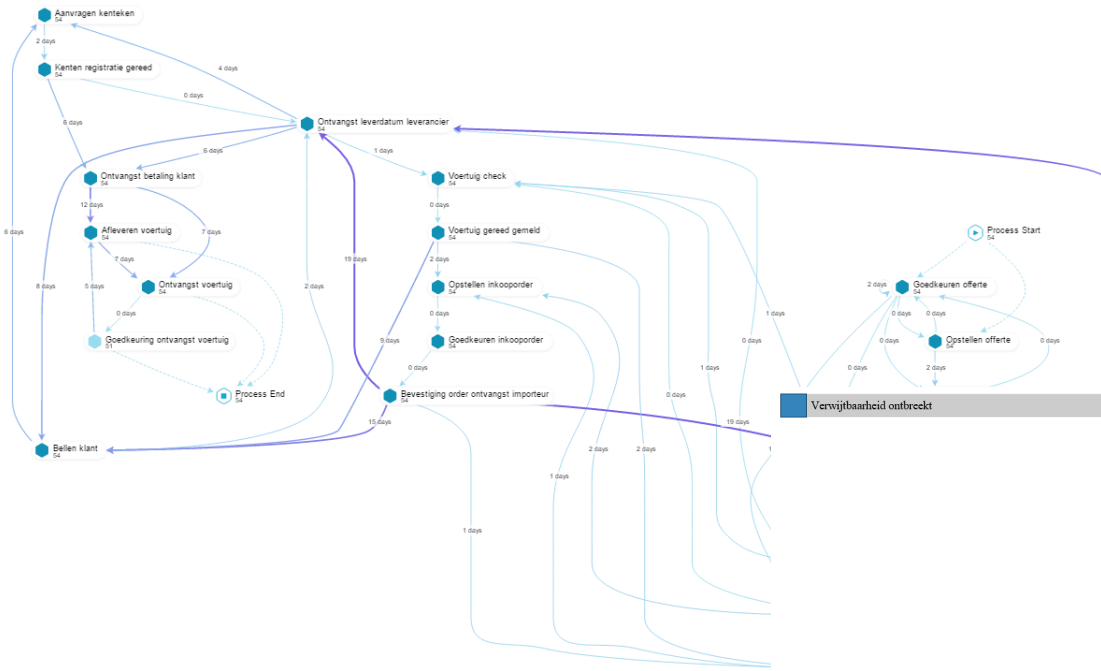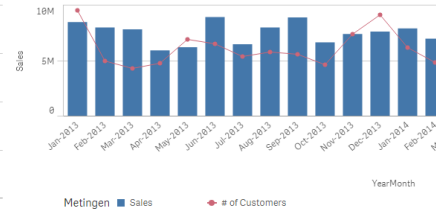
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Decisions

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Overall

H) How can we make it happen? (optimization)

G) What's the best thing that can happen? / What will happen next? (predictive modeling)

F) What if these trends continue? (Forecasting / Extrapolation)

E) Why is this happening? (Statistical Analysis) - Feedback

D) Where exactly is the problem? (Query / Drill Down)

C) What actions are needed? (Alert)

B) How many, how often, where? (Ad Hoc Reports)

A) What happened? (Standard Reports)

A) Decision Mining
e.g.: Rapidminer

A) Decision Requirements
Model e.g.: DRD

Analysis (Feed-Forward)

Access and Reporting (Feedback)

Decision

Data

A) Process Mining
e.g.: Celonis

A) Proces Model
e.g.: BPMN

Proces

A) 'Business Intelligence'
e.g.: QlikSense

A) Fact Model

Numbers

.... Design Cycle
--------------- Intelligence Cycle
— — — — — Data Science

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Decision Mining

Prof. Dr. Martijn Zoet