



SEMIC 20
conference 23

Madrid  18 Oct
SAVE THE DATE

interoperable
europe
IN THE AGE OF AI

Using AI in support of digital- ready policymaking

An assessment of potential

In DK, new policies must be digital-ready

Opportunity:

Ensure legal basis for realising the potential of doing things more efficiently with a higher level of service and interoperability by using digital and data-driven solutions.



Challenge:

To detect policies with a high level of implementation risk. i.e. situations where legislation based on ambitious policy objectives are unmatched by digital foundation or allocated resources.



Examples of policies that is not digital-ready:

- Complex regulation with inconsistent concepts and definitions.
- Specification of analogue processes and formats.
- Reliance on discretionary judgement for case resolution in cases that do not need it.
- Implementation of supporting information systems not considered.

We're getting there

For all new legislation, the secretariat for digital-ready legislation works with ministries to ensure



We process significant amounts of text every year. But this only covers new legislation.

10.000 pages of text is the tip of the iceberg

- Legislation arising from new policies less than 10 pct. of all existing legislation
- Revision of policies must also be prioritised
- A method currently in development in collaboration with the OECD Public Governance Directorate and three ministries



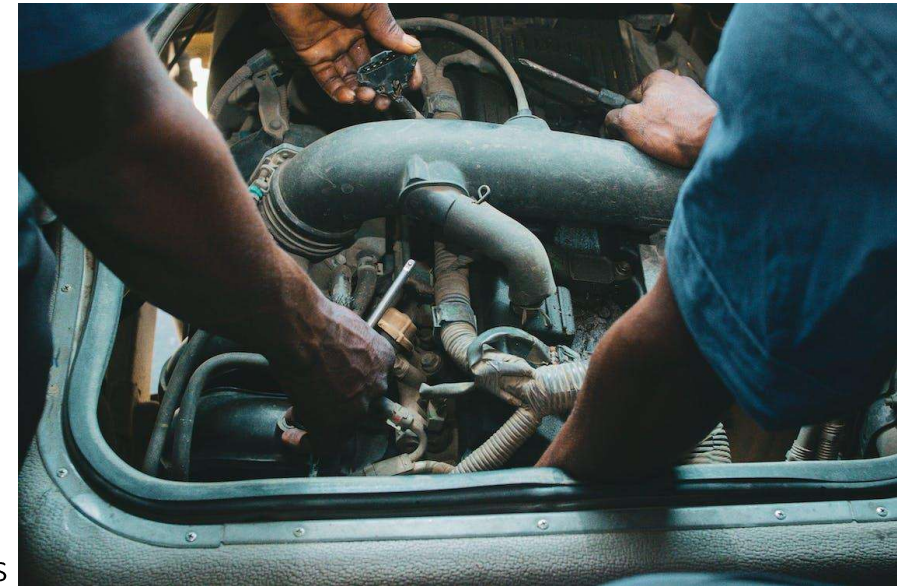
A pragmatic design

- Classifies legal acts into "green", "yellow" and "red"
- Handles the amounts of text and the ambition of quality through a tiered approach:
 - **First stage:** Tool-supported and near automated screening of large amounts of text (*green/yellow*)
 - **Second stage:** A more manually based assessment of relevant subsets of legislation (*green/yellow/red*)



An adaptable “infrastructure” for assessment

- Heuristic indicators based on:
 - Attributes of the legal act itself (lix, key words, date of text, number of inter-dependencies and citations in text etc)
 - Supporting data gathered as a result of the legal act (# of complaints, # of cases, cost of enforcement, # of reporting processes etc)
 - Assessments by experts about specific attributes (administrative overhead, potential for innovation of the domain etc)
- Method may be adapted for different contexts:
 - Thresholds for attributes for may be different
 - Depending on the availability of supporting data more assessments may be automated rather than conducted by experts



Caveats of the method

- Telling apples apart from oranges, but ...
- The real mission is to facilitate learning and reflection about good digital policy
- Generally, we want to lend the eyes of an expert to a broader audience
- What would characterise an expert?
 - Has an intuitive feeling for what a situation needs
 - Can pinpoint issues at great height
 - Can find the right balance
 - Knows where to look for tools and "prior art"



Using AI to extend the reach of experts?

- Potential quick fix solutions:
 - Using LLM and NLP to analyse and summarise relevant parts of text connected with our three core processes
 - Screening
 - Producing consultation responses
 - Evaluating the impact
- A longer term ambition:
 - Enable learning from good digital practice across policy areas by using AI to overcome obstacles such as:
 - Skimming and codifying large amounts of text
 - Haystack challenges
 - Saying the same but with different words



10.03.2023

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Thomas T. Hildebrandt

- 2018- Professor, Dep. of Computer Science, Copenhagen University, Denmark
 - 2023 - Head of Data Steward Study Programme
 - Member of Danish Standard (D) (ISO) groups for AI & Cyber-security
 - Advisory board for D-seal
- 2018-2023 Head of research section for Software, Data, People & Society
- 2012- Private consultant, keynote speaker and lecturer in digitalisation
- 1999-2018 Researcher and teacher at IT University of Copenhagen
- 1996-1999 PhD in Computer Science, Århus University, Denmark



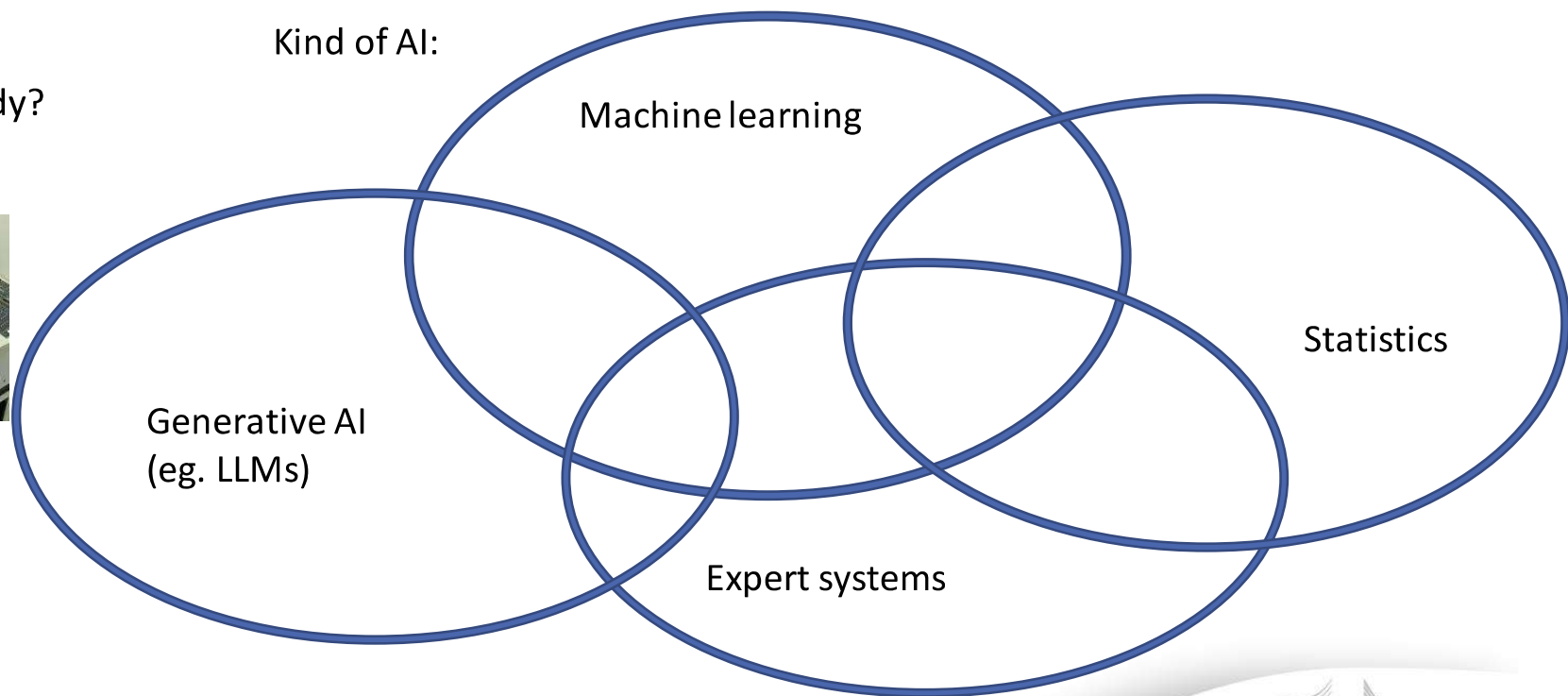
What is the problem? What kind of AI to use?

Problem:
Is this law/policy Digital-Ready?

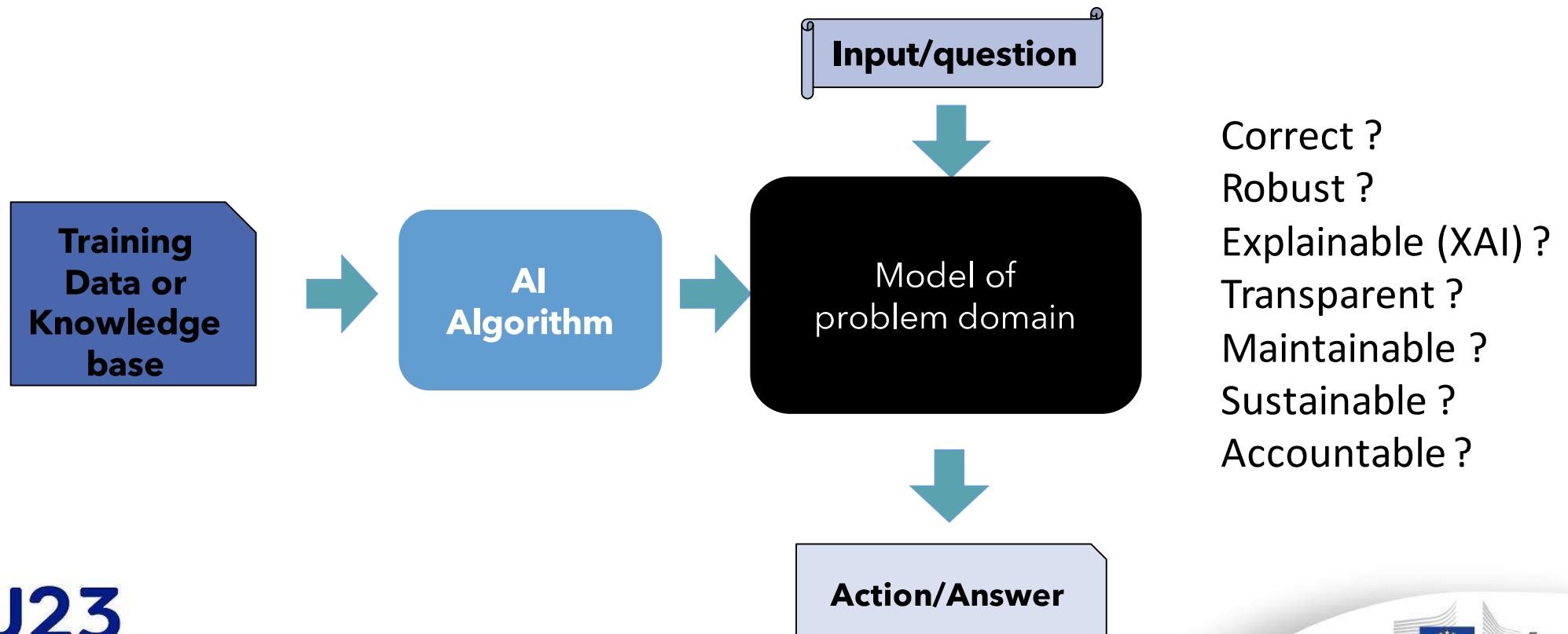
Law or
policy



Kind of AI:

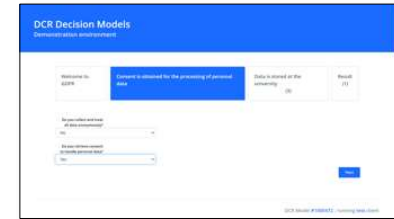


Any AI algorithm builds a model from data

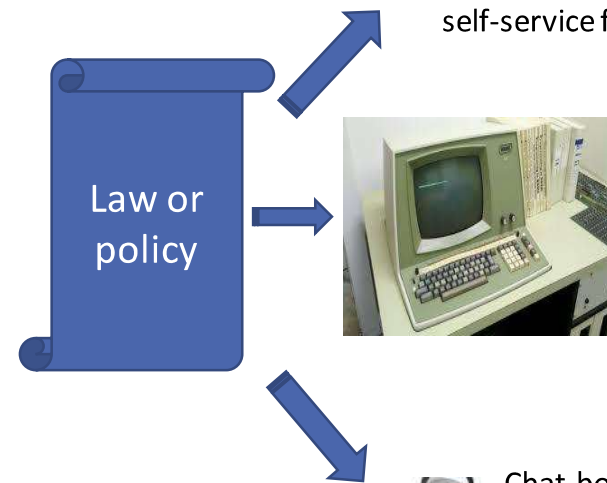


What does digital-ready law mean ?

- Complex regulation with inconsistent concepts and definitions ?
- Specification of analogue processes and formats ?
- Reliance on discretionary judgement for case resolution in cases that do not need it ?
- Implementation of supporting information systems not considered ?

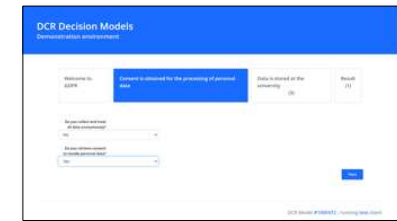


Dynamic Guidelines and self-service forms

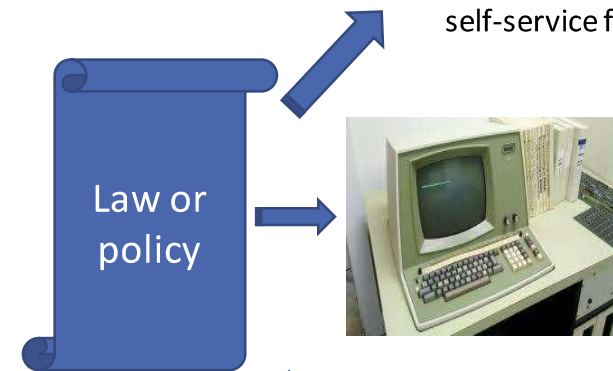


A large language model (LLM) may produce an answer, but has no deep knowledge of the above problems (sorry, no free lunch...)

How can we then use AI?



Dynamic Guidelines and self-service forms



We can use different kinds of AI to bridge the gap between Law and digital systems



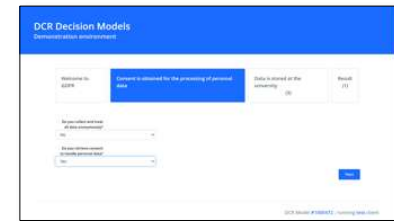
Use NLP and LLMs to markup law



Law or
policy



Markup of law
(roles, actions, rules,
meta-data..)

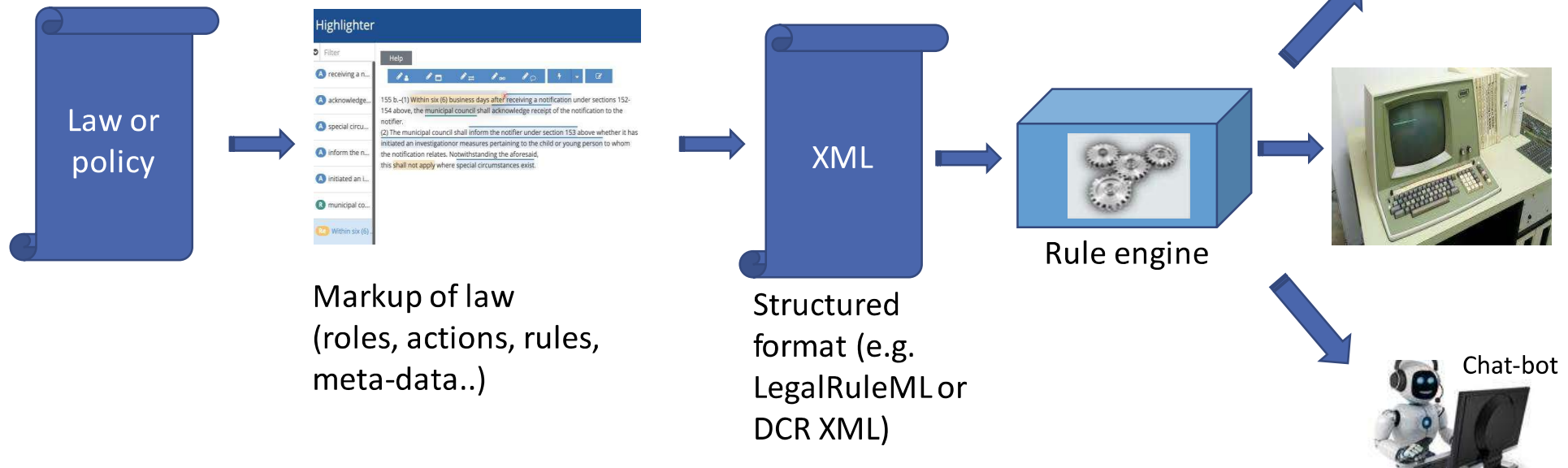


Dynamic Guidelines and
self-service forms



Chat-bot

Export markup as executable XML rules



Dynamic Guidelines and self-service forms



Chat-bot

Ecoknow.org research project (2017-2021)

Executive Order no. 1053 of 8 September 2015 (Current) Print-out date: 28 October 2015
 Ministry: The Danish Ministry of Social Affairs and the Interior File number: Ministry of Social Affairs and the Interior, file no. 2015-4958
 Later amendments to the regulation ACT No. 495 of 21 May 2013 ACT No. 722 of 25 June 2014

Consolidation Act on Social Services

An Act to consolidate the Act on Social Services, cf. Consolidation Act No. 150 of 16 April 2015, section 3 of Act No. 527 of 29 April 2015, section 1 of Act No. 529 of 29 April 2015, section 1 of Act No. 649 of 18 May 2015 and Act No. 660 of 18 May 2015.

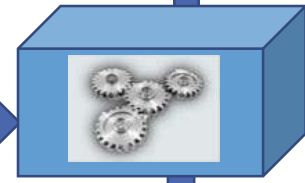
The amendment under section 1(ii) of Act No. 40 of 12 February 2014, the Act on Legal Protection and Administration, is incorporated into this Consolidation Act with effect from the effective date of this Consolidation Act.

155 b.-(1) Within six (6) business days after receiving a notification under sections 152-154 above, the municipal council shall acknowledge receipt of the notification to the notifier.

(2) The municipal council shall inform the notifier under section 153 above whether it has initiated an investigation or measures pertaining to the child or young person to whom the notification relates. Notwithstanding the aforesaid, this shall not apply where special circumstances exist.

NLP supported markup of law text
 Activities, Roles and Rules
 (Permissions, obligations & contra-to-duty)

DCR XML



Id	Titel	Deadline	Ansvarig	Handling
1	Affiliert Lægekonsultation	28.08.2019	Morten	[Icon]
2	Fosterbetænkning	28.08.2019	Morten	[Icon]
3	Fosterbetænkning	28.08.2019	Morten	[Icon]
4	Indberetning om skole	28.08.2019	Morten	[Icon]
5	Los sendelse skole	28.08.2019	Morten	[Icon]

Case management support

16/11/2023

SEMIC conference

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NLP
support

View

SUGGEST HIGHLIGHTS

actions

HELP

Role

Activity

Rule

Comment

DESCRIPTION

roles

rules

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Thomas Hildebrandt, hilde@di.ku.dk

20/5
2019

Participants
in EcoKnow



IT-UNIVERSITETET I KØBENHAVN



Danmarks Tekniske Universitet



NEC



DCR



INFO
VENTURE



MAPS
SHARING KNOWLEDGE



Syddjurs
KOMMUNE



KØBENHAVNS KOMMUNE



Kammeradvokaten
Advokatfirmaet Poul Schmith



GLADSAXE

ETH zürich



VRIJE
UNIVERSITEIT
AMSTERDAM



University of St.Gallen



Advisory board



TECHNISCHE
UNIVERSITÄT
WIEN



European
Commission

Example: GDPR guidelines today

...and make a PDF that describes what to do

Textual description

CHAPTER II

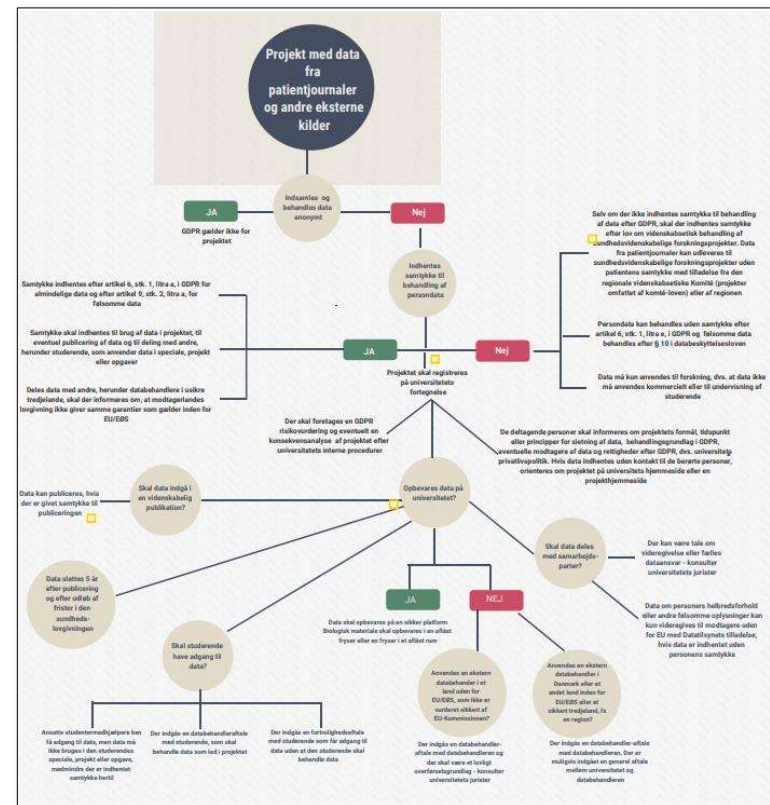
Principles

Article 5 - Principles relating to processing of personal data

1.

Personal data shall be:

- (a) processed lawfully, fairly and in a transparent manner in relation to the data subject ('lawfulness, fairness and transparency');
- (b) collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes; further processing for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes shall, in accordance with Article 89(1), not be considered to be incompatible with the initial purposes ('purpose limitation');
- (c) adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed ('data minimisation');
- (d) accurate and, where necessary, kept up to date; every reasonable step must be taken to ensure that personal data that are inaccurate, having regard to the purposes for which they are processed, are erased or rectified without delay ('accuracy');
- (e) kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the personal data are processed; personal data may be stored for longer periods insofar as the personal data will be processed solely for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes in accordance with Article 89(1) subject to implementation of the appropriate technical and organisational measures required by this Regulation in order to safeguard the rights and freedoms of the data subject ('storage limitation');
- (f) processed in a manner that ensures appropriate security of the personal data, including protection against unauthorised or unlawful processing and against accidental loss, destruction or damage, using appropriate technical or organisational measures ('integrity and confidentiality');



Digital-ready GDPR guidelines

Create a digital, executable version of the rules

Raw text describing the rules

CHAPTER II
Principles
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- (c) adequate, relevant and limited to what is necessary in relation to the purposes for which the personal data are processed ('data minimisation');
- (d) accurate and, where necessary, kept up to date; inaccurate personal data shall be rectified, erased or anonymised, and the measures taken shall be proportional to the harm that can be caused by such inaccuracy ('accuracy');
- (e) kept in a form which permits identification of the data subject for the purposes for which the personal data are processed, for as long as is necessary for those purposes ('storage limitation'), unless the personal data are processed for scientific or historical research purposes or statistical purposes or for the purposes of archiving in the public interest, in which case the principle of storage limitation shall not apply; where the personal data are processed for scientific or historical research purposes or statistical purposes, the data controller shall implement appropriate technical or organisational measures in order to safeguard the rights and freedoms of the data subject in connection with the processing of the personal data ('integrity and confidentiality');
- (f) processed in a manner that ensures appropriate security of the personal data, including protection against unauthorised or unlawful processing and against accidental loss, destruction or damage, using appropriate technical or organisational measures ('security').

Welcome to GDPR

Consent is obtained for the processing of personal data

Data is stored at the university

Result

Do you collect and treat all data anonymously?

No

Handle GDPR data

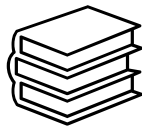
Do you retrieve consent to handle personal data?

Cancel

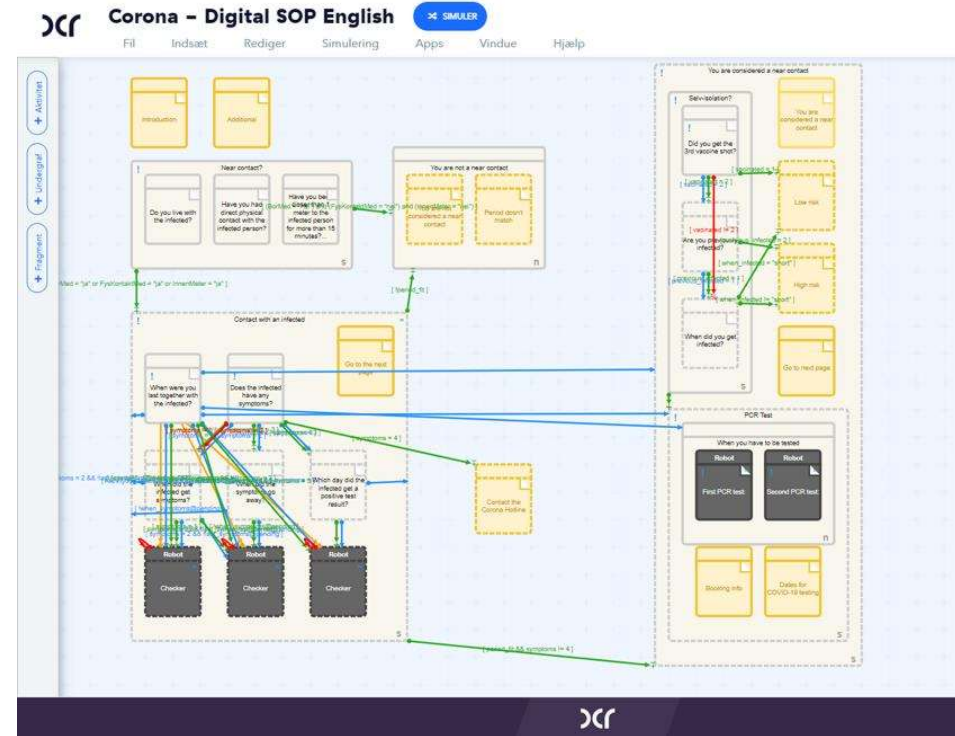
Next

Powered by DCR

Example: Covid-19 guidelines



11 page guidance, with 14 updates



Digital business process

DCR SOP

Corona - Nærkontakt SOP

Start Kontakt med smittet Konklusion

Next

Få svar på om du er nærkontakt og hvad du skal gøre

Ved at besvare spørgsmålene kan du finde ud af om du er nær kontakt, om du skal gå i selvisolation og hvornår du skal tage PCR test.

Bor du sammen med den smittede?

Har du haft direkte fysisk kontakt med den smittede?

Har du har været tættere end en 1 meter på den smittede i mere end 15 minutter?

OBS: Hvis du er omfattet af særlige omstændigheder bør du læse disse retningslinjer:

- Særlige retningslinjer for børn.
- Særlige retningslinjer for personale der arbejder i sundhedssektoren og med ældre.

DigiLegi project (awaiting funding)

Contact us for collaboration: Hilde@di.ku.dk

