



University of
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Smart Cities Research Group

Smart Cities: Combining Technology with Citizen Participation

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Smart cities

- Smart city is a concept
- Most definitions includes the use of computer technology
- Main objective is to improve quality of life for its citizens
 - Provide better services
 - Reduce environmental footprint, sustainability
 - **Facilitate participation**

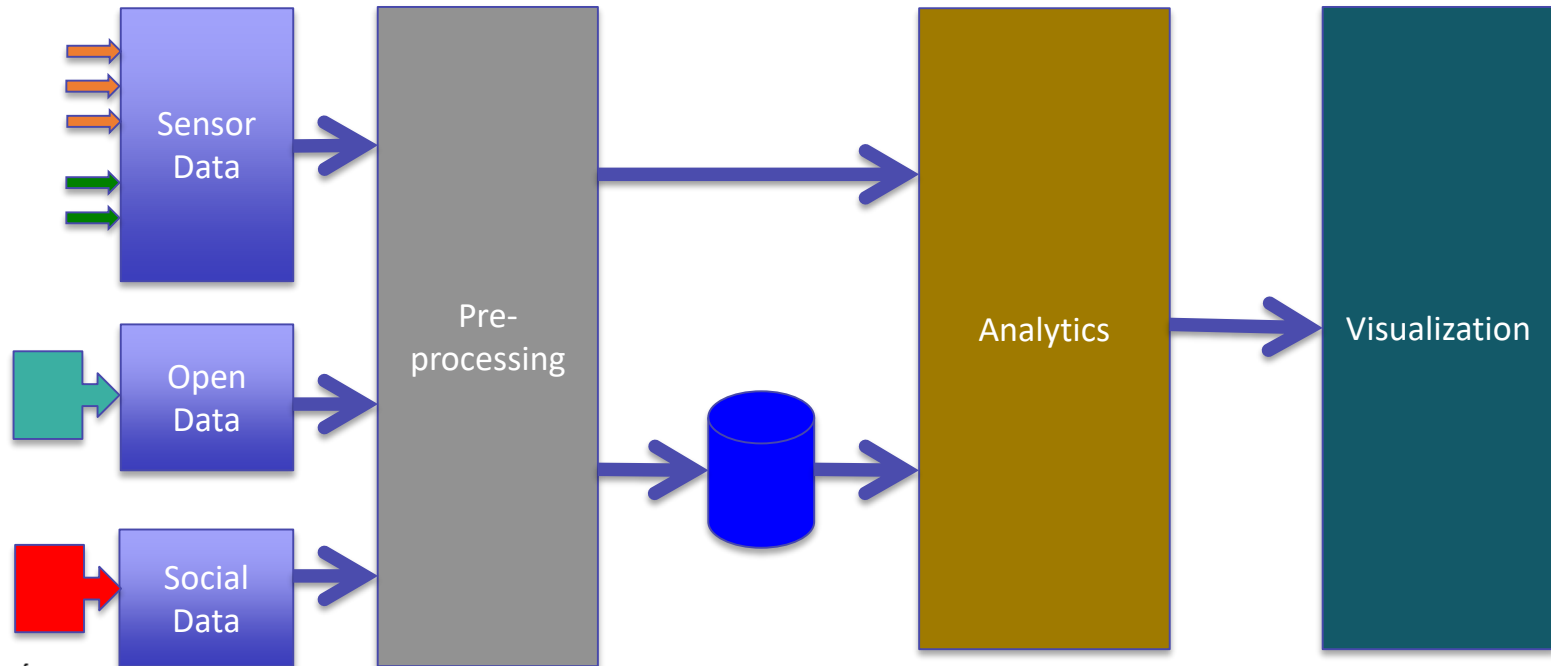
Citizen Participation

Political participation

Non-political participation

- experts (sharing their competence)
- as volunteers (sharing their time) or both

Our Approach to Smart Cities Research and Development



Citizens as Sensors

- Citizens collect data using their own senses and make an action to report their observations, but they can also be sensor platforms by carrying sensors around.
- We define a “human sensor” as a citizen that helps collect data about his/her surroundings.

Literature Study

Found 23 papers describing human sensor projects:

- Public transport,
- Smart parking,
- Air quality monitoring,
- Waste reporting,
- Urban planning and development,
- Crisis/emergency response.

Case Studies

- FixMyStreet (FiksGataMi)
 - Web application to report problems, mostly related to infrastructure
- MinSak
 - Web application to submit citizen initiatives and collect signatures

Why This Case Studies?

- The simple answer: Data access
- In both cases data is available, and easy to harvest through web mining

FixMyStreet (FiksGataMi)

- Norwegian version of FixMyStreet: FiksGataMi.
- FixMyStreet is a web application allowing citizens to report issues and problems related to infrastructure and waste to local authorities.
- Was developed by mySociety, a British NGO with a mission to make citizens more powerful in the civic and democratic parts of their lives. (Open Source)

FixMyStreet (FiksGataMi)

- The original FixMyStreet was launched in 2007. The application is location based. The user may pinpoint the location on a map.
- Typical problems are holes in the road, broken light bulbs in street lighting, abandoned vehicles, broken water pipes, etc.
- Norwegian version was developed and is maintained by the Norwegian Unix User Group. Released in 2011.

FixMyStreet (FiksGataMi)


FiksGataMi

Rapporter et problemDine oppdateringerAlle rapporterLokale varslersHjelpFORENINGEN NUUG

Manglende skilting ved kryssing av gangvei øvers i Torsrudveien

Rapportert i kategorien Trafikkskilter anonymt 16.00, mandag
Sendt til [Røyken](#) og [Statens vegvesen region sør](#) 5 minutter senere

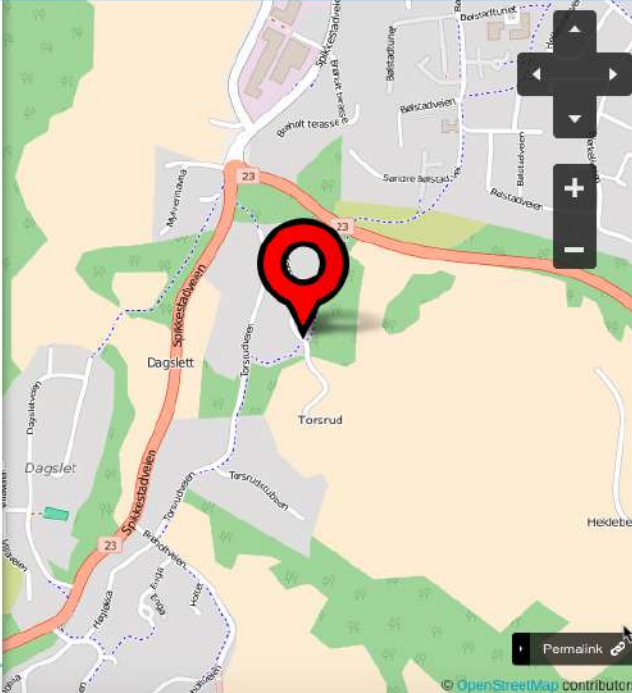
Det er ingen skilt i Torsrudveien for billister som krysser den. Bilveien går rett over gangveien, og det er fare for syklende og gående, særlig skolebarn. Fartsdumpen er kun på den ene siden og for langt unna, slik at bilene gir gass etter den og over gangveien.



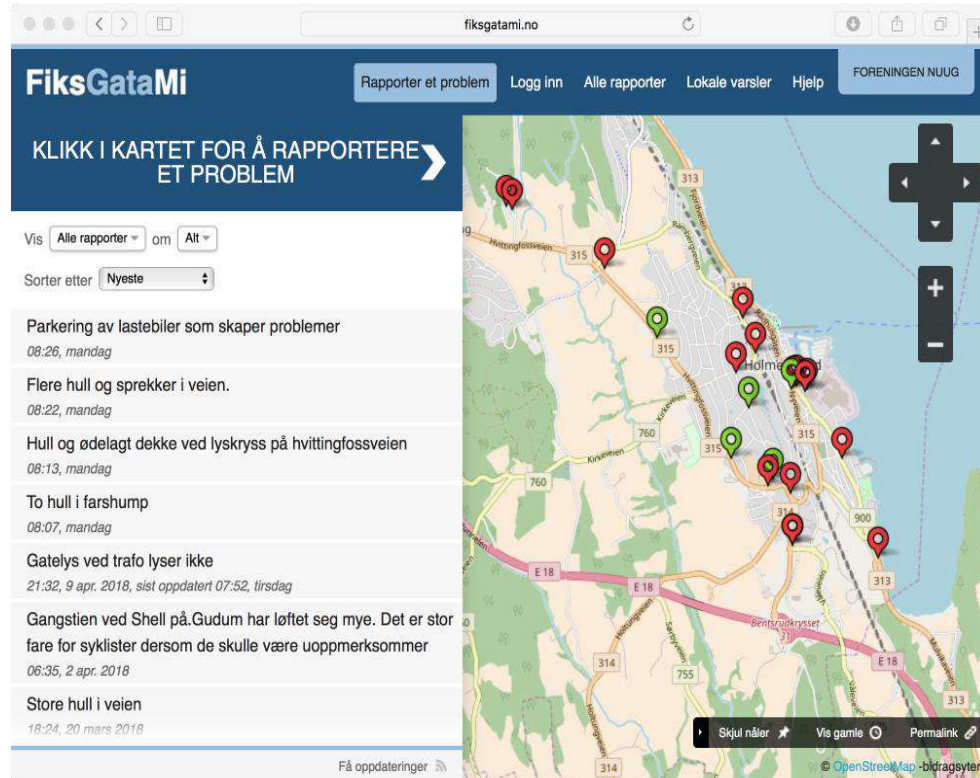
Det er mye biltrafikk over dette gangveikrysset og farten er ofte høy.

Her trengs det tydelige skilt som forteller at man krysser en

Rapporter misbrukFå oppdateringerProblemer i nærheten



FixMyStreet (FiksGataMi)



The screenshot shows the FiksGataMi web application. The browser address bar displays "fiksgatami.no". The page has a dark blue header with the logo "FiksGataMi" and navigation links: "Rapporter et problem", "Logg inn", "Alle rapporter", "Lokale varsler", "Hjelp", and "FORENINGEN NUUG". Below the header, a large blue button says "KLIKK I KARTET FOR Å RAPPORTERE ET PROBLEM".

On the left side, there are filters: "Vis" with a dropdown set to "Alle rapporter", "om" with a dropdown set to "Alt", and "Sorter etter" with a dropdown set to "Nyeste". Below these is a list of reported problems:

- Parkering av lastebiler som skaper problemer
08:26, mandag
- Flere hull og sprekker i veien.
08:22, mandag
- Hull og ødelagt dekke ved lyskryss på hvitvingfossveien
08:13, mandag
- To hull i farshump
08:07, mandag
- Gatelys ved trafo lyser ikke
21:32, 9 apr. 2018, sist oppdatert 07:52, tirsdag
- Gangstien ved Shell på Gudum har løftet seg mye. Det er stor fare for syklisters dersom de skulle være uoppmerksomme
06:35, 2 apr. 2018
- Store hull i veien
18:24, 20 mars 2018

The right side of the page features a map of Oslo with numerous red and green location pins indicating reported problems. Map controls like a compass and zoom buttons are visible on the right. At the bottom of the map, there are links for "Sjå nå", "Vis gamle", and "Permalink". The footer of the map area includes the text "© OpenStreetMap-bidragstere".

FixMyStreet (FiksGataMi)

The use has been quite stable since its launch in 2011. The first year had more reports, probably because of novelty and press coverage.

| Year | Number of reports |
|------|-------------------|
| 2011 | 9.751 |
| 2012 | 5.381 |
| 2013 | 6.655 |
| 2014 | 6.016 |
| 2015 | 6.365 |
| 2016 | 6.375 |
| 2017 | 6.932 |

FixMyStreet (FiksGataMi)

| Rank | Report recipient (authority) | Number |
|------|---|--------|
| 1 | Public Road Administration, region east | 2,490 |
| 2 | Public Road Administration, region west | 1,113 |
| 3 | Public Road Administration, region middle | 880 |
| 4 | Public Road Administration, region south | 834 |
| 5 | Oslo | 603 |
| 6 | Trondheim | 490 |
| 7 | Hamar | 472 |
| 8 | Public Road Administration, region north | 454 |
| 9 | Bergen | 357 |
| 10 | Halden | 253 |

FixMyStreet (FiksGataMi)

| Category (Norwegian) | Category (English) | # |
|----------------------|--------------------------------|-------|
| Annet | Other | 72 |
| Buss- og togstopp | Bus and train stops | 52 |
| Dumpet skrot | Flytipping | 44 |
| Forlatte kjøretøy | Abandoned vehicles | 62 |
| Forsøpling | Rubbish (refuse and recycling) | 70 |
| Fortau/gangstier | Pavements/footpaths | 340 |
| Gatefeing | Street cleaning | 124 |
| Gatelys | Street lighting | 1,820 |
| Gater/Veier | Roads/highways | 830 |
| Graffiti/tagging | Graffiti | 0 |
| Hull i vei | Potholes | 1,847 |
| Offentlige toaletter | Public toilets | 1 |
| Oljesøl | (Oil spill) | 1 |

| | | |
|----------------------|--------------------------|-----|
| Park/landskap | Parks/landscapes | 50 |
| Parkering | Car parking | 75 |
| Snøbrøyting | (Snow ploughing) | 195 |
| Sykkelveier | (Bike roads) | 106 |
| Tette avløpsrister | Blocked drainage gullies | 119 |
| Trær | Trees | 116 |
| Trafikklys | Traffic lights | 83 |
| Trafikkskilter | Road traffic signs | 195 |
| Ulovlige oppslag | Flyposting | 4 |
| Universell utforming | (Universal design) | 13 |
| Vannforsyning | (Water supply) | 16 |
| Veinavn-skilter | Street nameplates | 31 |
| | - No category - | 290 |

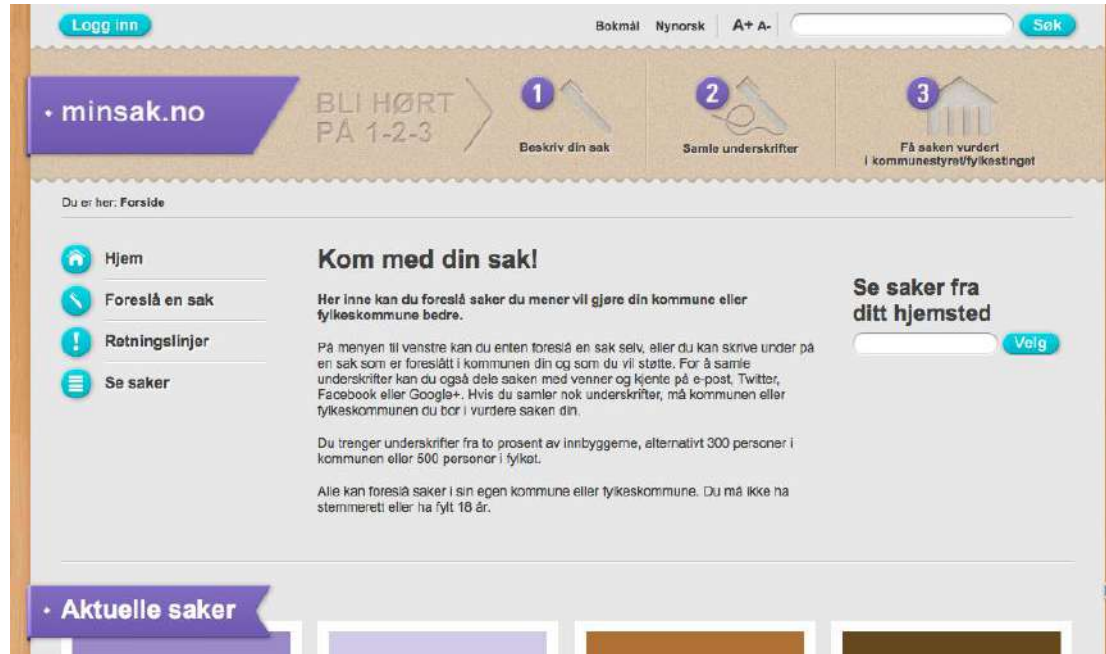
Citizen Initiative

- Between elections, citizens can raise issues by making a “citizen initiative”.
- The citizen initiative is embedded in the legislation. If the initiator manages to collect signatures from 2% of the population or 300 signatures, the local council is obligated to discuss the initiative.
- No positive response is guaranteed.

MinSak.no (MyCase)




- The government has established a platform “minsak.no” to facilitate both proposals and collection of signatures


MinSak.no





Logg inn Bokmål Nynorsk Sáamegiella


minsak.no

- 1  Beskriv din sak
- 2  Samle underskrifter
- 3  Få saken vurdert

 Foreslå en sak





 Se saker

 Retningslinjer

 Spørsmål og svar


Se saker fra ditt hjemsted

Del denne saken

Nei til bygging av ny Coop Extra i Lauvåsen Drangedal

Drangedal, Telemark



Logg inn

BokmålNynorskSámegiella

⌵⌵⌵

🔍

☰

minsak.no

1

Beskriv din sak

2

Samle underskrifter

3

Få saken vurdert

Foreslå en sak

Se saker

Retningslinjer

Spørsmål og svar

Se saker fra ditt hjemsted

Underskrifter til El-sparkesykler i Bergen by

Tilbake til saken

Ann Cathrin Tangseth

Emilie Hestholm Larsen

Johannes Lofstad Tangseth

Jørgen Lofstad Tangseth

Kristoffer Bruvik

Miranda Dias

Natalie Handeland

Sondre Hilleren

Stian Tangseth

Tea halland

Thorstein Bohne

Tove Skudal

FixMyStreet vs. MinSak.no

- FixMyStreet (started 03.2011): **61.221**
- MinSak.no (started 02.2013): **1.950**

Findings

- It is easier to get citizens involved with non-political participation than with political participation
- For non-political participation in may be a combination of egoistic and altruistic motives
 - I want this problem to be fixed
 - I want this fixed so other may benefit.

Findings

- For political participation, the lower engagement may be caused by several factors:
 - The process of submitting a citizen initiative may be too complicated
 - Few citizen initiatives are successful.

Conclusions and Future Work

- We have shown the use and also what kind of reports citizens are making.
- Both cases provide a feedback mechanism to the people reporting issues, letting them know when the case has been resolved.
- This is likely important when it comes to retention rates and continued usage of the systems.
- We have more data to analyze, and will do a more thorough study of usage patterns. Another idea is to study the motivation for citizens making the reports.

A New Way of eParticipation

Results from a Pilot Project

Background

- Research by Hibbing and Theiss-Morse has shown that citizens are not necessarily eager to participate.
- The citizens have voted for politicians to handle politics and are more concerned that the government provide good services to its citizens.

J. R. Hibbing and E. Theiss-Morse. *"Stealth Democracy- Americans' beliefs about how government should work"*. Cambridge University Press, 2002.

Social Media

- Many citizens avoid discussing politics in social media
- Debate climate is often harsh, and dominated by «trolls»
- Discussions often ends up with attacks on persons and not discussing issues in a peaceful way
- The need for an alternative solution

Lightweight Democracy

- Our research group discussed the concept of lightweight democracy in a conference paper and a book chapter in 2016.
- In January 2018, we met two entrepreneurs, Trond Henriksen and Terje Andersen, sharing the same ideas of political participation.

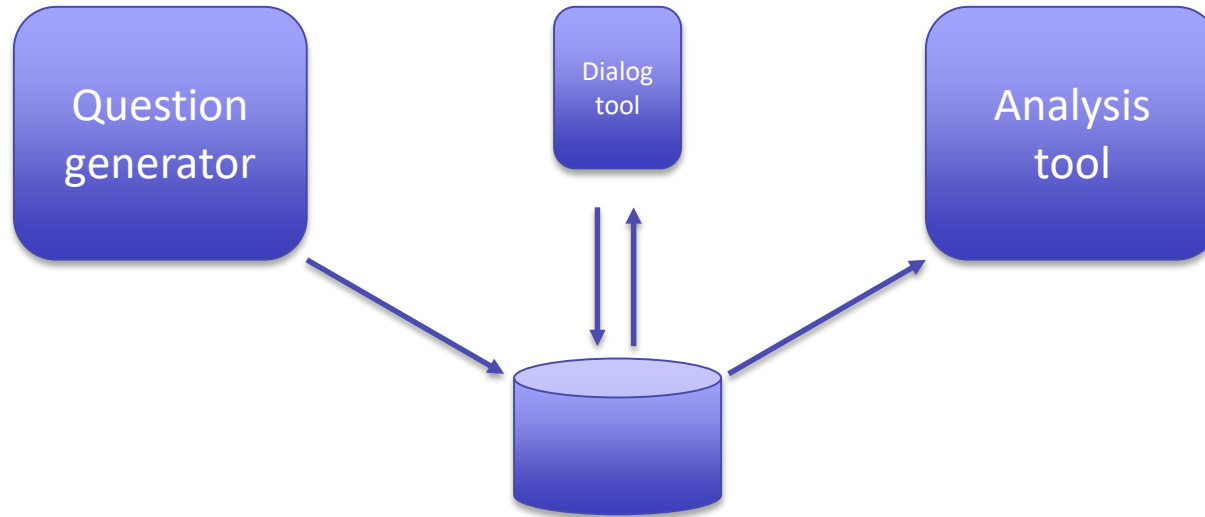
Berntzen, L., & Johannessen, M. R. (2016). The Role of Citizen Participation in Municipal Smart City Projects: Lessons Learned from Norway. In J. R. Gil-Garcia, T. A. Pardo, & T. Nam (Eds.), *Smarter as the New Urban Agenda: A Comprehensive View of the 21st Century City*. Switzerland: Springer.

Johannessen, M.R., & Berntzen, L. (2016). Smart Cities Through Implicit Participation: Using Gamification to Generate Citizen Input for Public Transport Planning. In *Electronic Government and Electronic participation*.

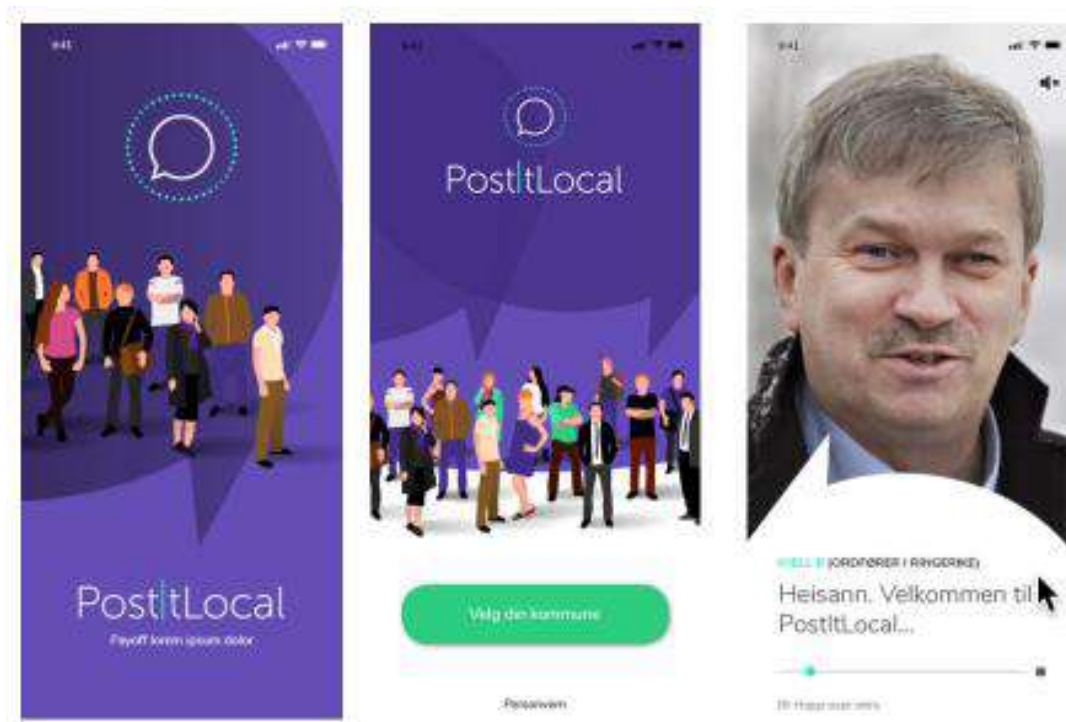
Pilot Project

- Financed from regional research fund.
- Aim: Develop an app where the mayor of the can consult with citizens on current issues (*In practice it is not the mayor that decides on questions, it is more the executive council, but citizens relate to the mayor*).
- Aim: Use not more than two-three minutes of the time, so easy to use that you can do it in the checkout queue at the supermarket.

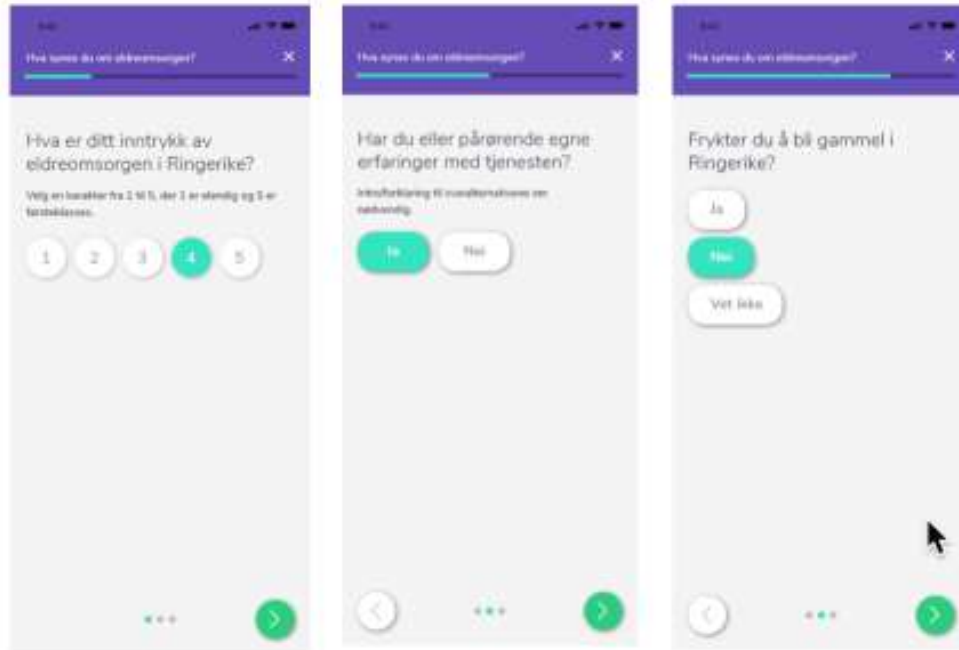
Architecture



App Screen Shots



App Screen Shots



App Screen Shots



Methodology

- Workshops with politicians (12 mayors, more than 50 politicians)
- Alpha-testers (lean startup, minimum viable product)
- Beta-testers from five municipalities (approx. 250)
- Survey of beta-testers (183)

Workshops with Politicians and other Stakeholders

- Agreement that municipalities have a potential for better communication with their citizens, especially regarding younger citizens
- Concerns about ownership of data and privacy
- Should everyone be included or use a representative group of citizens?
- What questions can be asked?
- Who will develop the questions (e.g. executive council)?

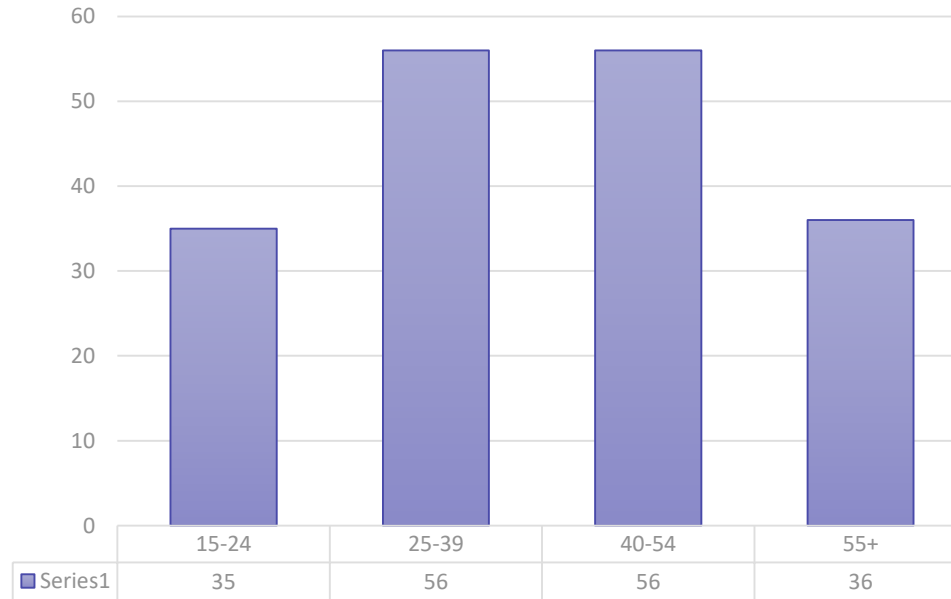
Workshops with Politicians and other Stakeholders

- The project is only partly about technology
- The most important issue is how to use the app to achieve the objective of better communication
- Therefore, most of the work has been targeting procedures, and proper training of the politicians
- It should be used to get input on everyday issues, not ideology
- Lots of positive feedback from mayors and politicians

The Survey

- Distributed to 250 test users
- Received 183 responses

Gender and Age



Education Level

| Education level | % |
|----------------------------|------|
| Primary school | 18,6 |
| Secondary school | 16,5 |
| Vocational school | 8,5 |
| University (undergraduate) | 27,1 |
| University (graduate) | 29,3 |

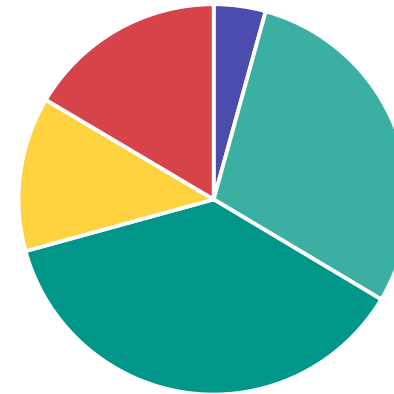
Education level is somewhat higher than national average

Gamification

We wanted to know how gamification would motivate the users, e.g., some kind of rewards or getting levelled up.

Gamification motivates use?

- Blue: Totally agree
- Light green: Partly agree
- Dark green: Neutral
- Yellow: Partly disagree
- Red: Totally disagree

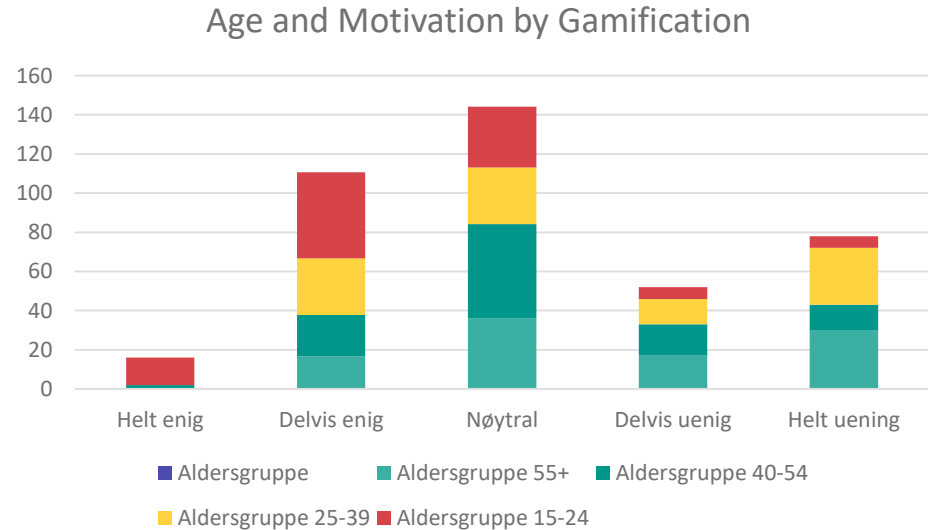


■ Helt enig ■ Delvis enig ■ Nøytral ■ Delvis uenig ■ Helt uenig

Gamification

- Scale is:
 - Left: Totally agree
 - Right: Totally disagree
- Broken down into age groups:
 - Red: 15-24
 - Yellow: 25-39
 - Dark green: 40-54
 - Light green: 55+

*Gamification may have impact
on some users*



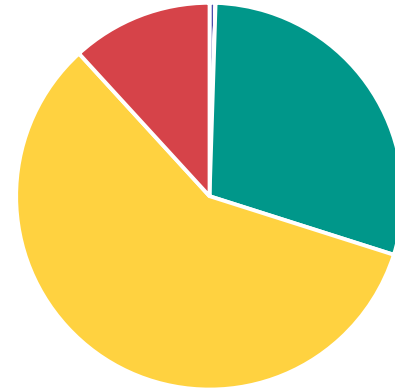
Political Activity

- Been member of or liked a group or page discussing politics (35,5)
- Been member of, or liked politician or party in social media (25,5)
- Signed a petition/campaign (25,5)
- Been in contact with a politician by phone, e-mail or personal meeting (25,0)
- Commented on a political entry in social media (23,9)
- Participated in a people's meeting (19,7)
- Been member of a political party (18,6)
- Been in contact with a politician or party through social media (16,0)
- Written an opinion in the newspaper (13,3)
- Expressed opinion in a people's meeting (12,2)
- Used the comment function in electronic newspapers (12,2)
- Participated in public demonstration (8,0)
- Written political blog entry (2,0)

The Mayor on the Greeting Page

- The first thing the citizen sees is a picture by the mayor and a request to provide feedback.
- Green = neither/nor
- Yellow = positive
- Red = very positive

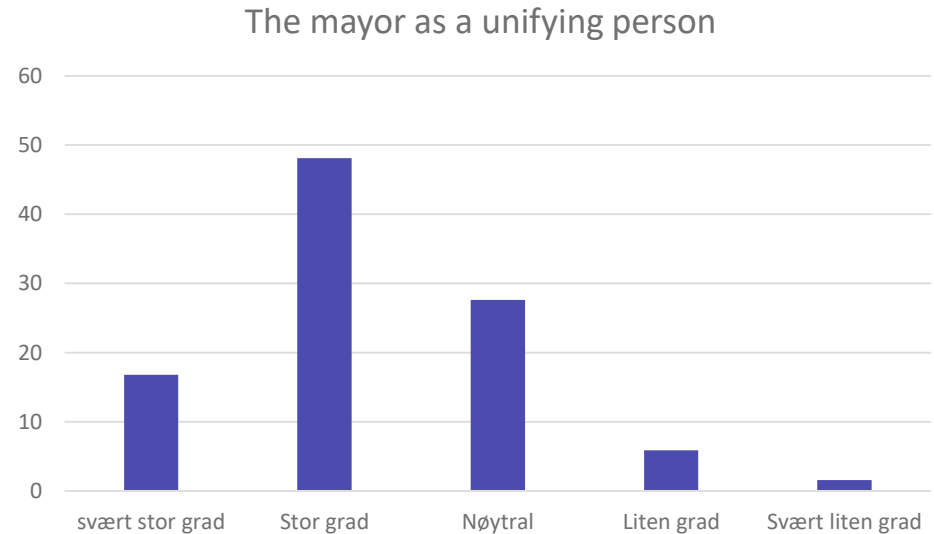
Mayor on the Greeting Page



■ Svært negativt ■ Negativt ■ Hverken eller ■ Positivt ■ Svært positivt

The Mayor as a Unifying Person

- We wanted to know if the mayor is regarded as a unifying person (a mayor for all citizens).
- Scale:
 - Left: Very large extent
 - Right: Very small extent



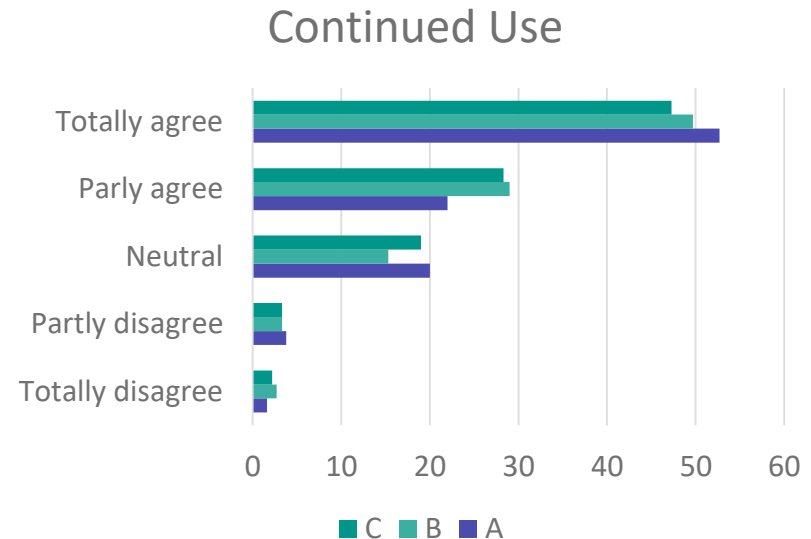
Expectations

We asked the respondents of their expectations:

- I expect my input to have direct impact on the municipal policy-making (6,5)
- I expect to be listened to, and that my opinion is taken into account when discussing relevant issues (64,1)
- I have my say, but am not expecting that it is used (22,2)
- No expectations (7,1)

Continued Use

- A. If the app gets available for everyone, I will continue to use it
- B. I will probably use the app if it is available after the testing period
- C. It is more likely that I will say may opinion to the municipality through the app



Continued Use

- The previous slide shows reasonably good agreement on the answers from the three questions
- Just over 70% answer "completely agree" or "partially agree" on whether they will continue to use the app if it becomes available, while about 25% are neutral.
- Thus, only 5% partially or totally disagree that they will continue to use the app to provide input to the municipality.
- The results are promising, giving hope for success if the solution is operated properly in each municipality.

Thank you for listening

If you are interested, please stay in touch
lasse.berntzen@usn.no