

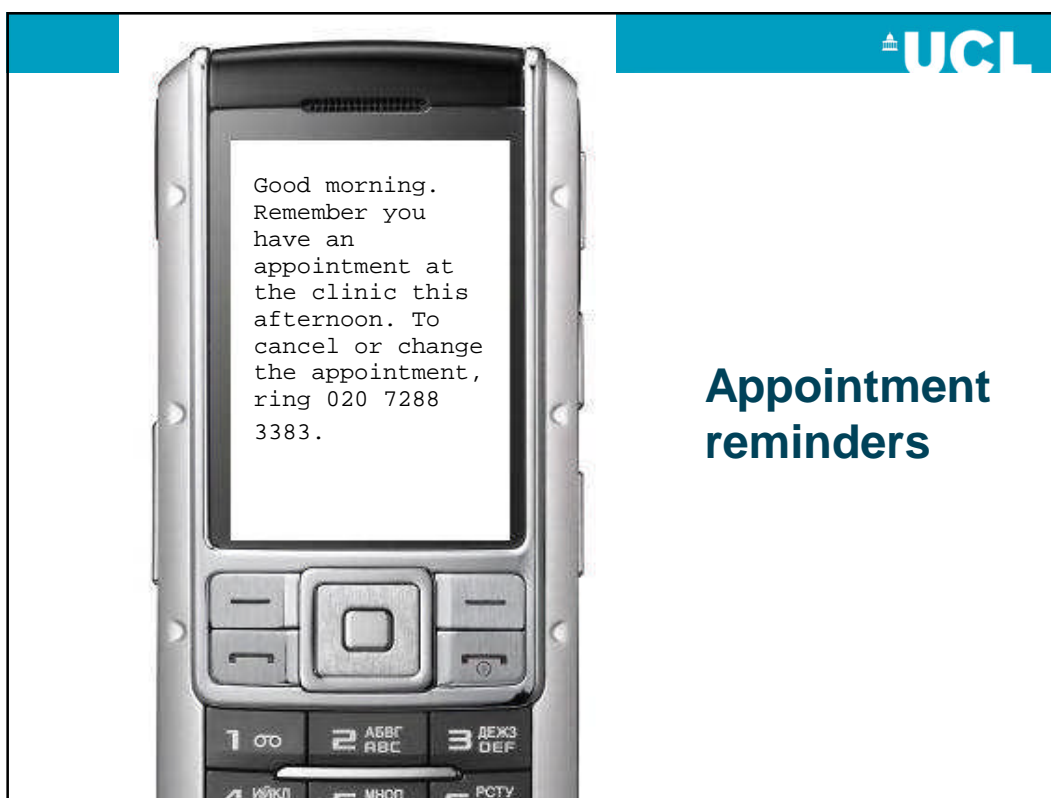


Mobile is here

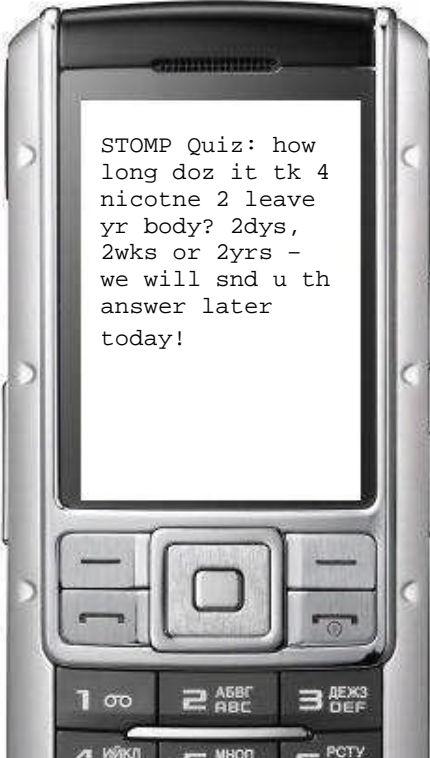
- >4.6 billion users worldwide
- Always-on, always-with-me
- Phone ⇒ computer
- Numerous uses in m-health, m-libraries, m-learning...





Appointment reminders

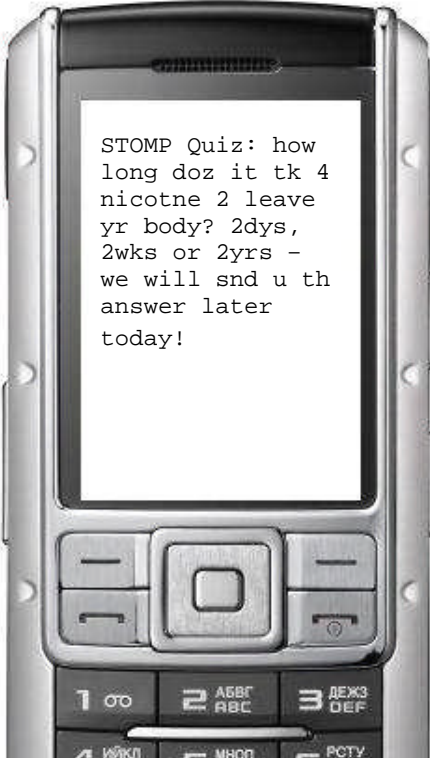
- 22 million missed appointments in the NHS *per* year, costing ~£790 million
- SMS (text) reminders widely used outside medicine, from hairdressers to vets
- SMS reminders reduce non-attendance rates between 6-38% in RCTs
- SMS reminders demonstrated to be cost-effective
- Need to be integrated into booking systems



STOMP Quiz: how long doz it tk 4 nicotne 2 leave yr body? 2dys, 2wks or 2yrs - we will snd u th answer later today!


Behaviour change

Example from Rodgers *et al.* (2005), *Tob Control* **14**: 255-61



Behaviour change

- More intensive than a single reminder
- Proven to work
 - Smoking cessation: 1.7-2.4 times higher likelihood of giving up smoking
 - Medication adherence: 11%-23% improvements
 - Long-term conditions: various trials showing improvements for diabetes




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M2M (machine to machine)


- Direct messaging from home glucometer/ coagulometer/ sphygmomanometer
- Patient-reported outcomes on hospital wards (with a cheap, easy-to-clean, droppable device)
- Emergency alerting systems

Dr Foster's Patient Experience Tracker



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Personal health records




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PHRs: personal health records

- Electronic health record controlled by the patient, or with patient access
- Patient's mobile phone acts as an additional way of accessing the PHR

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And the future...?

Devices attached to the mobile phone
— eSTI² receives £4M grant

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And...

- Mobile computerised Cognitive-Behaviour Therapy
- Epidemiology
- M-learning
- ...

Y r u obsessed w apps? :-)

- Don't overlook SMS (text) & interactive voice response
- Near universal coverage; no fragmentation
- UK
 - 62M population, 82M mobile phone subscriptions, 25M smartphones, 40% smartphone penetration
- India
 - 1220M population, 973M mobile phone subscriptions, 33M smartphones, 3% smartphone penetration

“Utopia is that which is in contradiction with reality” – Albert Camus

- So many promises have been made for technology that were not delivered
 - Choose & Book (Green *et al.*, *BMC Med Informatics Dec Mak* 2008, **8**, 36)
 - Connecting for Health (Greenhalgh *et al.*, *BMJ* 2010, **340**, c3111)
- Problems scaling up m-health systems
- M-health still dominated by technology ‘push’ rather than clinician ‘pull’
- Proprietary, commercial systems under-delivering

But remember the 1880s...

- We got used to (fixed) phones!
 - The Lancet warns that if patients can telephone and converse with their doctors “for a penny, they will be apt to abuse the privilege” (1883); to diagnose by telephone rather than in person is “not in accord with the true ideal of professional duty” (1887)
- What we need from m-health now is...
 - Scalability
 - Interoperability
 - Clinically reassuring

Principles to support technology innovation?

Involve users in design

Allow co-evolution of technology and usage

Recognise issues with top-down and bottom-up approaches (middle-out?)

Address the complexity of work practices

Address organisational issues

Get the infrastructure right

Technology push v. user pull

In electronic health records: Greenhalgh, Potts *et al.*, *Milbank Quarterly* 2009, 87(4):729-88


“if you think IT is the solution to your problem, then you don't understand IT, and you don't understand your problem either.”

Roger Needham, CBE

- To make systems work, you need buy-in from staff: how will the system benefit *them*?
- Don't just think at the top level: how can each ward/GP surgery/district nurse use it?
- Adoption of technology is a fluid and contingent process of change, entailing a co-evolution of work practices and the technology, where each adapts to the other
 - Marc Berg talks of "growing" rather than building IT systems and working to achieve synergy among three fundamental (re)design tasks: technical system, primary work process (e.g. clinical care) and secondary work process (e.g. audit)






Manager: Let's outsource the appointment reminder system. It will be easier to commission and no extra workload for our staff.

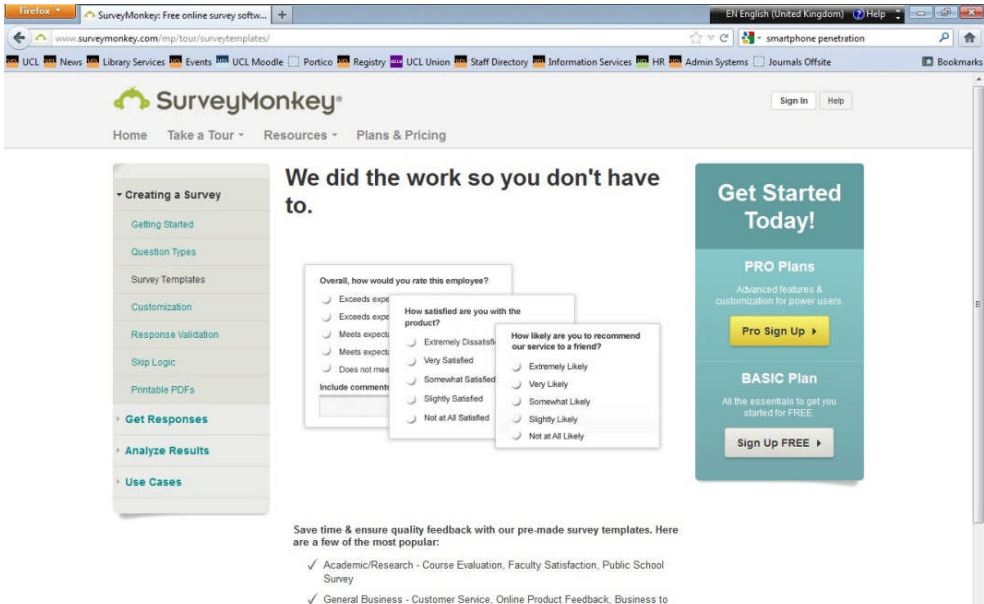


Patient: I didn't get a reminder, so I thought my appointment had been cancelled...

Receptionist: We don't control that system. I don't know how it works.

Make it easy-to-use



The screenshot shows the SurveyMonkey website with a navigation menu on the left, a central content area with survey examples, and a 'Get Started Today!' sidebar on the right. The central content area includes a sidebar with links like 'Getting Started', 'Question Types', and 'Survey Templates'. The main content features the headline 'We did the work so you don't have to.' followed by three survey question examples: 'Overall, how would you rate this employee?', 'How satisfied are you with the product?', and 'How likely are you to recommend our service to a friend?'. Below these are two call-to-action buttons: 'Pro Sign Up' and 'Sign Up FREE'.

Home Take a Tour Resources Plans & Pricing

Creating a Survey

- Getting Started
- Question Types
- Survey Templates
- Customization
- Response Validation
- Skip Logic
- Printable PDFs

Get Responses

- Analyze Results
- Use Cases

We did the work so you don't have to.

Overall, how would you rate this employee?

- Exceeds expect
- Exceeds expect
- Meets expect
- Meets expect
- Does not meet
- Include comments

How satisfied are you with the product?

- Extremely Dissatisfied
- Very Satisfied
- Somewhat Satisfied
- Slightly Satisfied
- Not at All Satisfied

How likely are you to recommend our service to a friend?

- Extremely Likely
- Very Likely
- Somewhat Likely
- Slightly Likely
- Not at All Likely

Get Started Today!

PRO Plans
Advanced features & customization for power users.
[Pro Sign Up](#)

BASIC Plan
All the essentials to get you started for FREE.
[Sign Up FREE](#)

Save time & ensure quality feedback with our pre-made survey templates. Here are a few of the most popular:

- ✓ Academic/Research - Course Evaluation, Faculty Satisfaction, Public School Survey
- ✓ General Business - Customer Service, Online Product Feedback, Business to

Money

- Unlike Internet, most mobile activities have to be paid for
- What does the end user pay? What does the institution pay?
- Individual SMS are *exceedingly* cheap



- Operators want volume
 - Many health services do not deliver volume, so we have to think in terms of aggregating
- Considerable interest in health sector from mobile sector
 - ... but don't be surprised if they all withdraw again!
- Go for generic tools
- Often the simplest tools – access to e-mail, maps – are the most useful



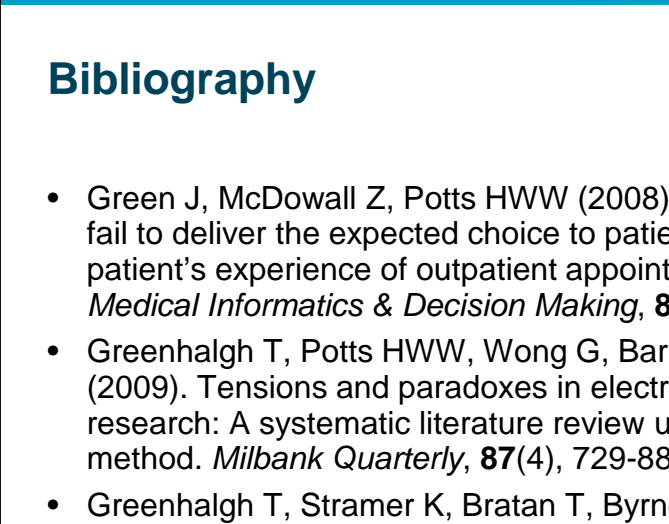
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“The future of cellular telephony is to make people’s lives better – the most important way, in my view, will be the opportunity to revolutionise healthcare.”

Martin Cooper, inventor of the mobile phone

Thank you

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- Greenhalgh T, Stramer K, Bratan T, Byrne E, Russell J, Potts HWW (2010). Adoption and non-adoption of a shared electronic summary care record in England: A mixed-method case study. *BMJ*, **340**, c3111.



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