OPTIMIZING CONNECTIVITY FOR MEDTECH

User Experience, Security, and Performance

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OUTLINE

Wireless Communications Technologies: What are the best technologies available today? What are their pros and cons? How to decide which technologies to use?

Challenges Specific to Medical Devices: What makes medical devices different from consumer devices? What are some best practices?

User Experience & Connectivity: What are the best practices for pairing and maintaining reliable connections? How do usability challenges impact security, adherence, and patient outcomes?

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STATE OF THE ART

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COMPARISON OF TOP CHOICES

	Wi-Fi	Bluetooth LE	LTE-M	NB-IoT	NFC
Internet Protocol	✓	✗	✓	✓	✗
Range (~m)	10	100	1,000	1,000	0.01
Throughput (~kbps)	100,000	100	5,000	50	10
Typical Power (~mW)	1,000	1	1,000	100	0.1
Roaming	Poor	Ok (PAN)	Very Good	Poor	Ok (PAN)
Cost	Medium	Low	High	High	Low
Workflow Complexity	High	High	Low	Low	Low

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MEDICAL DEVICE VS CONSUMER DEVICE

Are they different? Should we treat them differently?

- Regulations
- Risk of harm
- Vulnerability of users
- User expectations (this is a big one!)

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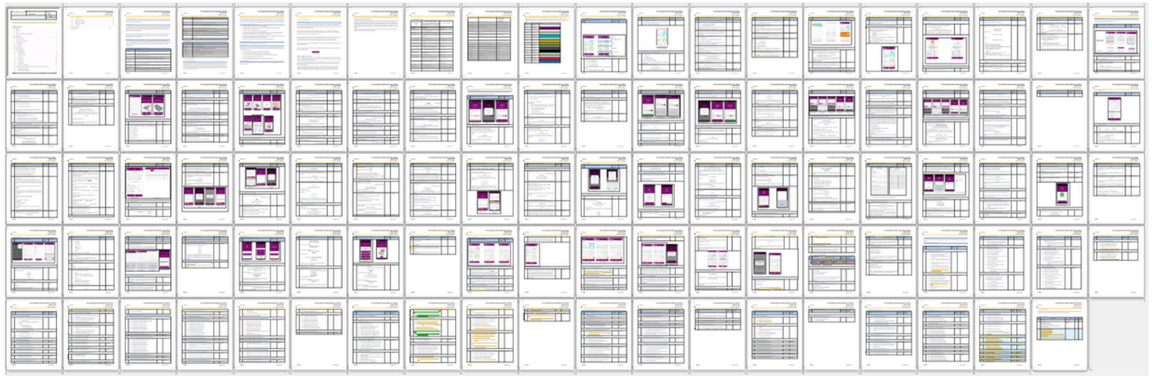
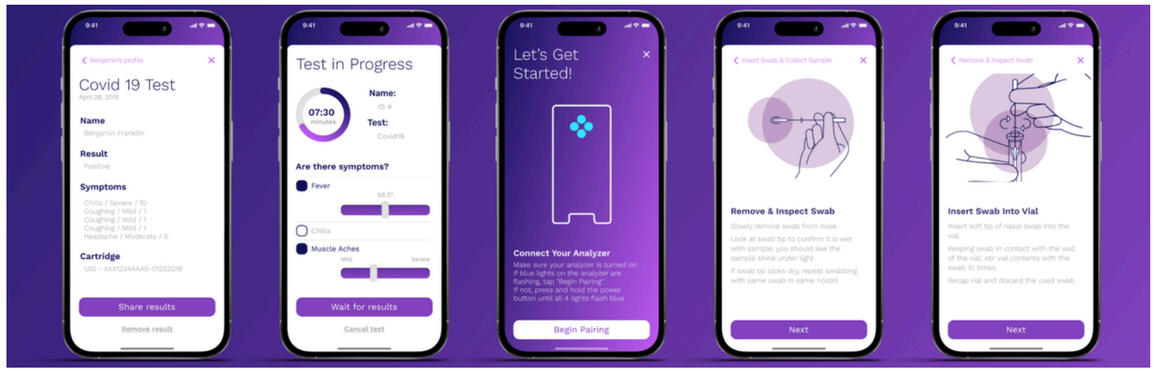
TECHNOLOGY IS EASY. WORKFLOWS ARE HARD.

- Users correlate confidence
- Developer bias
- Engineer's blinders
- The more intuitive the workflow, the more work went into it





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BEST PRACTICES FOR WIRELESS MEDTECH

Understand you user groups

Pick the right technologies for the use cases

Understand the desired workflows

Run through every conceivable unhappy path scenario

Manage state carefully

Communicate state clearly

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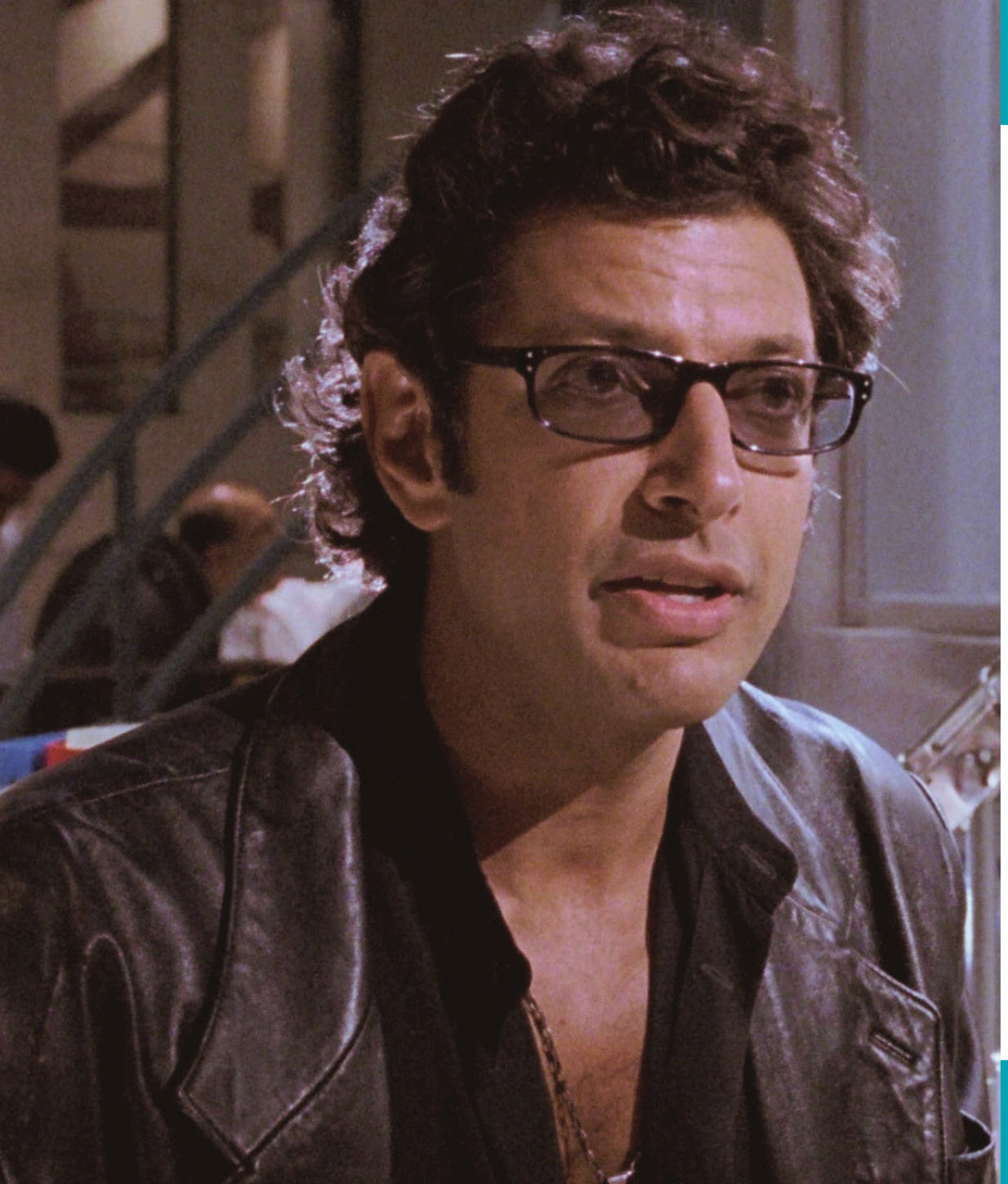

CYBERSECURITY

“Your Scientists were so preoccupied with whether or not they could…

That they didn’t stop to think if they should.”

- Requirements & rumors
- Exploitability of vulnerability vs likelihood of incident
- Benefit-risk analysis
- Making devices secure is difficult

Photo Jeff Goldblum as Dr. Ian Malcom in Jurassic Park

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QUESTIONS?

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