How do SOFTWARE ARCHITECTS find the way to USER EXPERIENCE?
With Google Maps!
The Images were taken from Apple’s "Get a Mac" Ad Campaign.

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https://en.wikipedia.org/wiki/Get_a_Mac
Visual Layers
Vector-Based Map
Load on Demand
Tile-Based Load
Visual Layers
Information Density
Browser-Based Software
• Don’t Copy the Old World
• Go for Great UX
• Integrated Architecture Decisions
Progressive Load
Preprocessed Images
Tile-Based Load
Parallelized Load
Visual Layers
Browser-Based

A lot of architectural work to enable great UX
# Server Requests?

[Image of Earth in space]

Data Acquisition

[Image of a zoomed-in view of Earth]

Limited Zoom Depth

[Images of additional zoomed-in views of Earth]
Relevance-Driven Depth
Combination of Data Sources and Capturing Times
Different Capturing Times at Different Zoom Levels

Great UX ≠ Perfection
Tradeoffs: UX, other Qualities, Time, Budget

Great UX ≠ Perfection

Same UX for Millions of Concurrent Global Users

Use Scalable Google Data Infrastructure (Filesystem, Processing, CDN, ...)
Content Preprocessing

- UX strongly needs performance and scalability
- Performance and scalability need strong architecture
Create Own Images
New Image Lifecycle
(Capturing, Processing, Storage, Delivery)
New 3D Projection
New Visual Transitions
Tile-based Load
Progressive Load
Multiplication of Data: Historic Snapshots
Think Differently
Create New Technologies
Economic Reasoning
Supportive Systems
Additional Map Data
(Speed Limits, Directions, One-Way Streets, ...)

Route Calculation: Server

Internationalization
(Labeling, Fonts, Units, ...)
Performance Optimization (Preprocessing)
Native Mobile Apps (iOS & Android)
Use Sensor Data (GPS, Gyro)

Tradeoff: Performance vs. Accuracy
UX has many Facets
(Interaction Concepts, Features, Performance, Internationalization, Offline Capability, ...)
Availability of new Technologies:
Impact on UX and Architecture
(Mobile, Touch Control, GPS Sensors, Gyroscope Sensors, ...)
Selection of Adequate Facets:
Consistent Cross-Platform UX
Dynamic Data
(High Change Frequency, Continuous Data Stream, Huge Number of Data Sources)
Impact on Route Calculation
(Preprocessing, more Data)
Visual Layers

- High Investment to Increase UX
- IoT Application to Increase UX
- Synergy with other Products: GPS Positions from Android
- Crowd (Waze App)
Data Integration (Static and Dynamic Data, Usage and Provision of APIs)

Impact on Route Calculation (Preprocessing, more Data)

UI Integration
○ Ecosystem (Domains, Partners, Systems, Business Models)
○ Integrated UX & Architecture across Ecosystem

> 5h

5h >
SOFTWARE ARCHITECTS

USER EXPERIENCE

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Fraunhofer IMS
Pragmatic Evaluation of Software Architectures
Springer