Achieving Management Success in an IoT World

HOW TO WORK WITH GEOGRAPHICALLY DISPERSED, MULTI-DISCIPLINE TEAMS, MINIMAL RESOURCES, AND IMPENDING DEADLINES WHILE MAINTAINING CUTTING EDGE INNOVATION.
Biography

- Close to 25 years in software development, including 20 in management
- Progressed from technical writing to software quality assurance to development
- Multiple industries
  - Retail systems
  - Fraud prevention
  - Web tracking
  - Cloud storage
  - IoT
- Current: Senior Director, Software Development @ Sigma Designs
Overview

- Managing geographically dispersed teams
- Hardware/software integration
- Managing the customer
- Challenges specific to IoT
  - Management
  - Technical
- The Future of IoT
Managing world-wide teams: the challenges

- Traditional challenges
  - Requirements
  - Time zone
  - Language
  - Inter-team dependencies
  - Vendors vs. employees

- Challenges unique to/or more pronounced in IoT world
  - Access to hardware
  - Technology differences between countries
Managing world-wide teams: overcoming the challenges

- **Requirements**
  - Do: have multiple meetings (ideally in person) to discuss requirements in detail
  - Don’t: give offshore team a document and say “Get back to us when you’re done”

- **Time zones**
  - Overlap with onshore teams as much as possible
  - Be willing to have calls during traditional “non-working” hours onshore
Managing world-wide teams: overcoming the challenges

- **Language**
  - Talk to (on phone or in person) leads on offshore teams prior to engagements
  - Ensure written communication is clear and concise
  - Be willing to swap out resources due to communication and language issues

- **Inter-team dependencies**
  - Map out and document dependencies, including ETAs on completion
  - Ensure that all teams have paths forward in the event of blockers; i.e. if a task is blocked, team should be able to proceed on separate path
Managing world-wide teams: overcoming the challenges

▶ Vendors/consultants vs. employees
  ▶ In many cases, consultants may perform same roles as employees
  ▶ But they cannot and should not be treated the same
    ▶ Labor laws dictate differences
    ▶ Employees most valuable commodity
    ▶ Cost must be factored in
      ▶ Scope of work must be maintained
      ▶ On-site presence (if necessary) incurs additional $$
Managing world-wide teams: overcoming the challenges

- Unique to IoT
  - Hardware access
    - Ship hardware offshore
      - Pros: Provides exact same setup as local teams
      - Drawbacks: cost, availability, and delays when HW changes are needed
      - Best option when: HW is stable and availability is not limited
    - Provide remote access
      - Pros: avoids cost and delays of shipping HW overseas
      - Drawbacks: Network connectivity and IT restrictions
      - Best option when: HW is still undergoing changes and network connectivity issues can be resolved
Managing world-wide teams: overcoming the challenges

Unique to IoT

Technology differences

- Standards may not be the same (E.g. cellular networks)
  - Develop to standards of destination region (i.e. target market)
  - Test offshore to point until standards diverge
  - Final testing must be in target market
Managing world-wide teams: overcoming the challenges

▶ Unique to IoT
  ▶ Access to support equipment may be more challenging
    ▶ Be prepared to ship equipment – factor in costs to budget
    ▶ - OR - allow remote access

▶ Legal differences
  ▶ Data sharing and access laws may differ
    ▶ Ensure you are aware of and understand laws
Hardware and Software Integration

- Dependencies: Technical
  - SW often dependent on HW
    - Chips
    - Boards
    - Connections
  - Reverse can be true
    - Testing purposes
      - Low-level drivers
Hardware and Software Integration

- **Dependencies: Logistics**
  - When HW is behind SW
    - Intentionally due to lead time on silicon
    - Schedule delays and/or problems with HW require rework
  - How to keep SW progress moving
    - Develop on alternative platforms – depending on application
      - Scaled-down versions of standard O/S: Linux, etc.
      - Use Arduino and other “mini” development platforms (if applicable)
    - Test using simulators and field-programmable gate arrays (FPGAs)
Hardware and Software Integration

- Dependencies: Management
  - Ensure HW and SW teams are in alignment
    - Communication – verbal and written – is key
    - When discrepancies occur (and they will), immediately identify path to resolution
    - There are no "winners" when misalignment occurs – the team loses
  - Plan schedules carefully!
    - Don’t get caught with a frozen schedule
    - Long lead times for HW
Customer Management: Expectations

- Time to market
  - As the vendor you want to be first
  - As does the customer
- Feature set
  - "Kitchen sink" vs. phased-in approach
- Cost
  - What is acceptable?
Customer Management: Expectations

- Few precedents in IoT
  - Lack of clear definition of the market
  - Minimal # of products and applications
- No true leader
  - Smaller companies can make their mark
  - Though customers naturally trust larger vendors
Customer Management: Expectations

- Lack of precedent and chaotic market
  - Can be used to your advantage
  - Engineering/Product Management can set expectations

- However...
  - A savvy customer may use the lack of precedent to THEIR advantage

- Control the “expectation dance”
  - ...if you can
Managing the Customer: Delivery

- **Pre-release**
  - Ensure release process is followed
    - Assumes process is thoroughly documented and tested
    - Assumes teams are in agreement that release is ready
      - And/or Engineering/QA have recommended to move forward
      - If not: ultimately product owner makes decision and takes risk
  - In IoT world, manufacturing is involved in HW and SW
    - Means GA of HW and SW must be ready long before release to customer
Managing the Customer: Delivery

- Delivery
  - IoT: manufacturing must be coordinated with customer
  - Customer may have own testing process
  - For pure SW (e.g. cloud/server-side)
    - Deploy to data center (cloud)
    - Provide central, controlled location for download (customer-hosted)

- Post-delivery
  - Regular communication with customer
    - Be prepared to fix and turn around defects quickly
    - Expectations again are key
The Future of IoT

The Market
- The elusive “killer app”
- Acceptable price points
- Small startups vs. the “big guys” – can they adjust?

The Technology
- Will standards converge?
- Or will using existing standards provide easier on-ramp?
Achieving success in the IoT age

- Geographic dispersed teams
  - Focus on communication
- Hardware and software integration
  - Focus on collaboration
- Managing the customer
  - Control the expectations dance
- Riding the IoT wave
  - What will we be talking about 5 and 10 years from now?
Questions?