

Requirements Engineering as a Surrogate for Business Case Analysis in a Mobile Applications Startup Context



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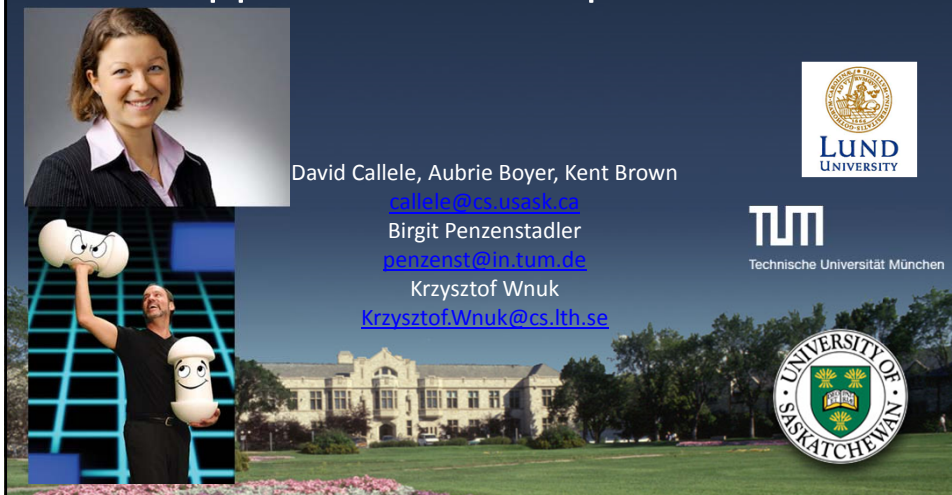
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Problem Statement

- Mobile applications development operates in a market characterized by **low barriers** to market entry, **short time-to-market** and the need for **rapid return on investment**
- Innovations in this market are often acquired or based on freely available frameworks, e. g. Google Android
- Business analysts are rarely members of a startup team.



Problem Statement

- Market research indicates only 24% of developers plan their apps based on discussions with users
- A business analyst is typically responsible for **the initial customer contacts**, assessing the viability of the business case and ensuring that the product requirements represent market needs **MISSING!**
- Requirements engineers are responsible for **translating the product requirements into a requirements specification** suitable for guiding a development effort

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Our Response to the Problem

- We posit that **extending RE practice to applying requirements engineering techniques to at least some of the issues usually addressed in the business case analysis** would enhance the viability of these entrepreneurial endeavors
- This approach enables improved:
 - value proposition definition,
 - compliance of the product definition with the value proposition and
 - focus of development efforts upon the business goals

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Mobile App Entrepreneurship Camp

- The mobile application entrepreneurship camp focused on providing business skill training to technology-trained aspiring entrepreneurs.
- External stakeholders had never worked together on a single project before:
 - Six service provider entities (local university or the innovation support community) and three local businesses that provided philanthropic support

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Camp Participants

- Recruited via a competitive call for participation based on the following criteria:
 - Ability to learn and utilize the course materials, work and education history
 - Oral and written communication skills
 - Entrepreneurial potential
 - Product concept
- Four projects selected from 25 applications

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Participation Requirements

- The **primary requirement** was to deliver a product that was ready for deployment (or as close as possible) within the appropriate mobile application store and within the constrained time and resources
- The secondary requirement was to **develop a supporting business plan** and a pitch for third-party investment

RELAW 2011

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Camp Delivery

- The stakeholder requirements for the camp were met by an intensive four-month program focused on developing the business skills necessary for entrepreneurial success
- The camp was presented as a series of workshops and participant deliverables after each workshop were directed toward advancing their entrepreneurial endeavor

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Participant Learning Outcomes

- Each participant demonstrated their abilities in the following areas:
 - Business startup process, accessing and utilizing business resources
 - Requirements elicitation and prioritization
 - Finance and accounting
 - General and mobile app marketing
 - Legal aspects of intellectual property protection
 - Project management
 - Business and technical presentations
 - Public speaking

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Meeting Stakeholder Requirements

- While each participant began the camp with **a product concept**, these concepts were at various stages of maturity
 - all of the concepts were scoped in excess of what the given resources could accomplish
- An intensive and heavily mentored effort was undertaken to identify the intended customer (**stakeholder identification**) as well as their wants and needs followed by developing a clear description of the **associated customer value proposition**.

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Focusing on a Minimum Viable Product

- Unlike traditional RE where requirements are elicited from a known customer, the camp **required the definition of a new product for a projected market**
- This forced the participants to **identify the core customer needs**, enabling the participants to define the minimum viable product for their markets, **successfully completing an entire requirements scoping cycle** – from elicitation to scope commitment

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Project Management and Methodology

- Participants were **motivated by a payment structure** similar to disbursement models used by investors in early-stage startups
- Each milestone was comprised of **several deliverables** and participants would only receive a monetary stipend after successfully completing that milestone
 - M1: Define the Product
 - M2: Refine the Product
 - M3: Proof of Concept
 - M4: Complete ALPHA
 - M5: Complete BETA
 - M6: Delivery
 - M7: Investment Pitch

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Guiding Project Evolution

- We initially observed that the technology focused entrepreneurs proposed a **technology push** to a perceived customer problem **instead of focusing on a market pull**
- Customer test plans in these projects were focused **on evaluating functionality** and **usability**
- Technology-trained camp participants did **not consider** investigating the customer's **willingness to pay, or customer's ability to pay**

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Guiding Project Evolution (2)

- The project may be rejected in market testing, as experienced during the camp, resulting in a **pivot** where the fundamental nature of the business changes
- The observed operational pattern followed by the camp participants is described as **“build it, ship it, fix it, monetize it”**

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Guiding Project Evolution (3)

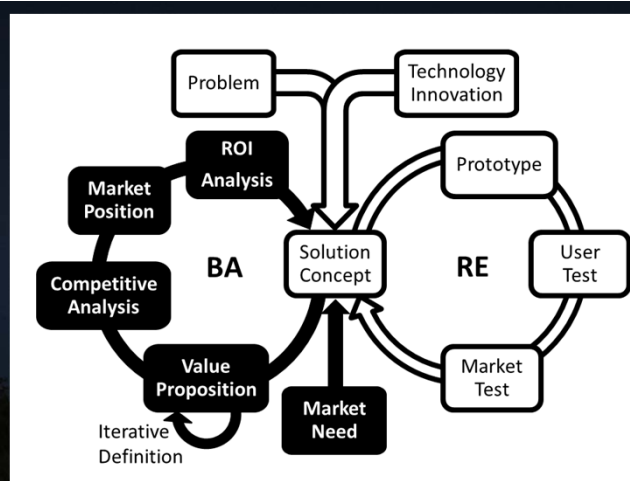
- The described pattern is a significant financial gamble – the developed product may be “as intended” but a viable monetization model may not exist
- We attempted to reduce this risk within the camp by requiring parallel development of the technology and monetization plans



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Observed vs. Desired Pattern



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Observations and Practitioner Guidance

- When BA is not available, can RE be used as a surrogate for BA?
 - We propose the use of traditional RE techniques **as a surrogate** that focus on business viability for the proposed product, particularly in contexts with significant time-to-market pressures
 - Participants can use tools that they have already used in the past as a (likely non-optimal) **improvement over not performing** any type of business case analysis

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Observations and Practitioner Guidance

- When BA is not available, can RE be used as a surrogate for BA?
 - The techniques used by business analysts and requirements engineers are quite similar
 - Challenge: domain specific terminology - in the same way that business analysts may not understand the technology details we find that requirements engineers are equally challenged by business terminology

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Challenges

- Transformation of the domain knowledge in the BA context
- Difficulty understanding the concept of market segments and target markets even though these concepts are similar to stakeholder groups
- Validation of business requirements can require significant domain expertise

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Which is more important – the business case or the product requirements?

- Sound business case analysis **significantly improves** the probability of delivering the desired product to the customer
- Requirements engineering can reliably deliver a valid product specification, but what if the customer **does not want (to pay for)** the specified product?
- Validated value proposition as the basis for the requirements effort will lead to a greater probability of commercial success

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Parallel Development: BA *and* RE

- Business case analysis can **begin at the same time** as prototype development used to elicit market feedback
- If the results of the business case analysis are positive then the **parallel start** on prototype development delivers a jumpstart on the overall development process, **reduces time-to-market**
- Pursuing a startup venture **in the absence** of a valid market value proposition significantly increases the probability of a pivot



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The Probability of a Pivot

- Two of the four projects were pivots on entry into the camp:
 - One pivot maintained the general nature of the product (stop-motion animation) but the target market(s) were completely redefined (the original market was not willing to pay)
 - In the second pivot, the original concept was discarded and an entirely new market opportunity was pursued



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Which is more important – the business case or the product requirements?

- We have been **unable to identify a plausible scenario** that justifies *not* performing a business case analysis
- We **cannot conclude that the business case is more important than the product requirements** but an antecedent business case analysis can greatly reduce the risk that the product requirements define a product that no one wants
- We note that, in the same way that customer willingness and ability to pay should constrain RE efforts, so **should technology constraints be considered in the business case analysis**

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Conclusions

- Investigated feasibility of extending RE practices by applying requirements engineering techniques to the investigation of commercial viability for proposed products and services
- RE-based efforts enhance the entrepreneurial endeavor's viability through:
 - improved value proposition definition,
 - compliance of the product definition with the value proposition and
 - focus upon the business goals for development efforts

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Conclusions

- Our results were generally supportive of the practice, successfully applying requirements elicitation, negotiation, prioritization, triage, scoping, tracing and validation to business case analysis tasks, particularly when guided by an experienced mentor
- **We do not consider this a best practice**, but our initial results indicate that using RE to perform business case analysis does benefit the project – particularly in the absence of any form of business case analysis
- For the camp participants, two of the four projects performed significant and successful business pivots that addressed real (and not just assumed) markets by the application of these techniques

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QUESTIONS?


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