Requirements engineering in Cloud Computing

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CS846: Advanced Topics in Requirements Engineering
Agenda

- Cloud Computing
- Motivation
- Case Study
  - Traditional RE Approach
  - Goal based RE Approach
- Conclusion
Cloud Computing

Application
- Monitoring
- Content
- Identity
- Runtime
- Queue
- Communication
- Finance

Platform
- Object Storage
- Database
- Compute
- Block Storage
- Network

Infrastructure

Cloud computing

Laptops
Desksops
Phones
Tablets
Advantages of Cloud Computing

- Flexibility
- Fault tolerance
- Cost Reduction
- Scalability
- Security
- Performance
Worldwide Public Cloud Services Revenue Forecast (Billions of U.S. Dollars)
Source: Gartner (October 2017)
Motivation for requirements engineering

- Best model, type and service
- Business priorities changes
Motivation for requirements engineering

- Product changes like adding new features or security policies
- Market change – targeting new market or customers
- New solutions and technical changes
Motivation for requirements engineering

- Government policy changes like Data localization
- Infrastructure costs
Case Study

Company X wants to move it’s Inventory Management application to cloud. Some of the key requirements –

- Security requirements
- Functional requirements
- Non Functional requirements – Availability, Support, Response time
- Future upgrades and maintenance
- Adhere to country’s data regulations
Traditional RE Approach

- Requirements Elicitation-
  - Initial stage of requirements
  - Gather core requirements
  - Search for cloud providers
Traditional RE Approach

- Requirements Analysis and Negotiation-
  - Gather information related to cloud providers
  - Reassess the requirements based on finding
  - Prioritization and negotiation
  - Risk analysis of the tradeoffs
Traditional RE Approach

- Requirements Evaluation-
  - Continuous process of evaluation
  - Short list candidates
  - Evaluate the end user goals
Traditional RE Approach

- Requirements Documentation and Management-
  - Informal contract
  - Documentation of finalized requirements
  - Document changes required in existing process
Goals based RE Approach

- Acquire and Specify Goals -
  - Strategic and business goals
  - Core goals
  - Operational goals
  - Define acceptance criteria for goals
Goals based RE Approach

- Search for Cloud Service Provider -
  - Search based on the generic goals
  - Critical goals need to be meet
  - Provide confidence degree for each functionality
  - Trial period
Goals based RE Approach

- **Performance matching** -
  - Gather information for operational goals
  - Evaluate score for each operational goal
  - Examine the global satisfactory score
  - Evaluate scores for multiple vendors
  - Also gather user reviews
Goals based RE Approach

- Analyzing Mismatch and Risks -
  - Evaluate mismatch in goals and tradeoffs
  - Clearly define risk factors which are intolerable
  - Preventive risk management strategy
    - Risk Identification
    - Risk Analysis
    - Risk Mitigation
Goals based RE Approach

- Finalize Cloud Provider -
  - Optimal cloud provider
  - Maximize satisfaction of goals and reduce risk
- Factors to assess –
  - Cost
  - Value
  - Risk
Conclusion

- What is cloud computing?
- Challenges in RE for cloud computing
- Case study
- Traditional RE Approach
- Goal based RE Approach
References

- https://www.researchgate.net/publication/228578811_Cloud_adoption_A_goal-oriented_requirements_engineering_approach
Thank You!

Q & A