1. **List Top 145 Factors Step**

|  |  |
| --- | --- |
| Reference Name (Year) | Factors ( number of frequency ) |
| Risk factors in software development projects: a systematic literature review (2019) | 1. **Requirement ambiguity (44)** 2. Requirement changes (32) 3. New technologies (30) 4. Incomplete Requirements (24) 5. Quality of documentation/ Specifications (24) 6. Bad Interfaces/Bad furnished components (27) 7. Technical complexity (25) 8. Lack of Integrations (18) 9. Develop the wrong functions and properties (17) 10. Lack of testing (15) 11. No planning or inadequate planning (25) 12. Low commitment of staff (20) 13. Insufficient discipline and standardization (19) 14. Unclear project objectives (19) 15. Ineffective communications between team members (19) 16. Scope changes (18) 17. Project progress not monitored closely enough (18) 18. Development methodology (16) 19. Staff does not have required skills (55) 20. Bad commitment of the user/customer (37) 21. Unstable organizational environment (30) 22. Bad estimation of resources (22) 23. Unrealistic schedule (21) 24. Staff inexperience (19) 25. High turnover (17) 26. Disagreement with customer (17) 27. Lack of top management commitment/support to the project (16) 28. Unstable budget (15) 29. Unreasonable customers (15) 30. Staff does not have required skills (55) 31. Requirement ambiguity (44) 32. Bad commitment of the user/customer (37) 33. Requirement changes (32) 34. New technologies (30) 35. Unstable organizational environment (30) 36. Shortfalls in externally furnished components/bad interfaces (27) 37. Technical complexity (25) 38. No planning or inadequate planning (25) 39. Incomplete Requirements (24) 40. Quality of documentation/ Specifications (24) |
| Success factors influencing requirements change management process in global software development (2019) | 1. Change impact analysis (83) 2. Change understanding (79) 3. Management support (77) 4. RCM process awareness (71) 5. Standards for RCM (70) 6. Progress measure (69) 7. Update requirements (67) 8. Minimize project failure risks (62) |
| Empirical Investigation About the Factors Affecting the Cost Estimation in Global Software Development (2021) | 1. Language and culture differences (15) 2. Time zone difference (14) 3. Communication infrastructure and process (12) 4. Competence Level (10) 5. Process compliance (9) 6. Geographical distance (9) 7. Team trust (9) |
| Risk prediction by using Artifial neural network in global software development (2021) | 1. Lack of ineffective PM methodology 2. Inappropriate task timings 3. Failure to provide resources 4. Failure in activity estimation and scheduling 5. Inappropriate planning 6. Unrealistic time estimate 7. Cost overruns 8. Inexperienced project manager 9. Project progress not monitored closely enough 10. Lack of balance on the project team 11. Lack of ineffective PM methodology 12. Inappropriate task timings 13. Failure to provide resources 14. Cost overruns 15. Inexperienced project manager 16. Project progress not monitored closely enough 17. Lack of balance on the project team 18. Inadequately trained development team members 19. Organizational and cultural differences of participants 20. Failure to provide resources 21. Lack of cooperation and coordination among team members 22. Loss of key resource(s) that impact the project 23. Inadequate technical resources 24. Lack of appropriately skilled resources 25. Scope creep 26. Project milestones not clearly defined |
| Taxonomical classification of barriers for scaling agile methods in global software development environment using fuzzy analytic hierarchy process (2020) | 1. Lack of organizational commitments 2. Poor organizational infrastructure 3. Temporal differences 4. Lack of Agile training 5. Inexperienced staff 6. Lack of roles and responsibilities 7. Poor requirements and their specifications 8. Lack of motivational strategies 9. Lack of project transparency 10. Budget constraints 11. Inappropriate selection of communication technology 12. Lack of customer involvement 13. Poor project scope 14. Limited project documentation 15. Cultural differences 16. Lack of communications 17. Project size and complexities 18. Excessive workload 19. Lack of knowledge sharing 20. Lack of trust 21. Lack of scaling tools and standards 22. Large team size |
| Practitioner's view of barriers to software outsourcing partnership formation: An empirical exploration (2019) | 1. Vendor opportunism and low mutual trust 2. Communication gap and poor client‐vendor coordination 3. Relational risk and poor relationship management 4. Insufficient quality of technical capability 5. Poor infrastructure and reluctance to change it 6. Poor quality of service and lack of co‐monitoring 7. Weak organizational proximity and work dispersion 8. Hidden cost and high anticipated switching cost 9. Lack of psychological contract and poor contract management 10. Poor knowledge sharing and cooperation between partners 11. Insufficient knowledge of the client activities and lack of domain training |
| Towards the Successful Requirements Change Management in the Domain of Offshore Software Development Outsourcing (2019) | 1. Lack of formal implementation of RCM methodology 2. Lack of change impact analysis 3. Lack of risk assessment at distributed sites 4. Lack of synchronizing work among involved sites 5. Inexperienced staff involvement |
| Success Factors during Requirements Implementation in Global Software Development: A Systematic Literature Review (2019) | 1. Effective and strong communication system 2. 3C (coordination, cooperation, and collaboration) 3. Using collaborative tools 4. Knowledge Management and sharing 5. Effective management 6. RE modelling |
| Effort Estimation in Global Software Development: A Systematic Literature Review (2014) | 1. Time Zone 2. Language Cultural Differences 3. Communication 4. Process Model |
| Empirical Investigation of Critical Requirements Engineering Practices for Global Software Development (2021) | 1. Identify and consult system stakeholders 2. Priorities requirements 3. Define system boundaries (requirement scope) 4. Define standard templates for describing requirements 5. Check requirements documents meet your standard 6. Unique identifies each requirement |
| A fuzzy analytical hierarchy process to prioritize the success factors of requirement change management in global software development (2020) | 1. Effective RCM leadership 2. Minimize project failure risk at GSD sites 3. Chang impact analysis in all sites. 4. Product quality improvement. 5. Management support. 6. Information sharing among distributed team members. 7. Rich information technology infrastructure in GSD. 8. Change acceptability 9. Updated requirements 10. Proper allocation of resources in GSD sites |

1. **Remove Redundant factors Step**

|  |  |
| --- | --- |
| Reference Name (Year) | Factors ( number of frequency ) |
| Risk factors in software development projects: a systematic literature review (2019) | 1. **Requirement ambiguity (44)** 2. Requirement changes (32) 3. New technologies (30) 4. Incomplete Requirements (24) 5. Quality of documentation/ Specifications (24) 6. Bad Interfaces/Bad furnished components (27) 7. Technical complexity (25) 8. Lack of Integrations (18) 9. Develop the wrong functions and properties (17) 10. Lack of testing (15) 11. No planning or inadequate planning (25) 12. Low commitment of staff (20) 13. Insufficient discipline and standardization (19) 14. Unclear project objectives (19) 15. Ineffective communications between team members (19) 16. Scope changes (18) 17. Project progress not monitored closely enough (18) 18. Development methodology (16) 19. Staff does not have required skills (55) 20. Bad commitment of the user/customer (37) 21. Unstable organizational environment (30) 22. Bad estimation of resources (22) 23. Unrealistic schedule (21) 24. Staff inexperience (19) 25. High turnover (17) 26. Disagreement with customer (17) 27. Lack of top management commitment/support to the project (16) 28. Unstable budget (15) 29. Unreasonable customers (15) |
| Success factors influencing requirements change management process in global software development (2019) | 1. RCM process awareness (71) 2. Progress measure (69) |
| Empirical Investigation About the Factors Affecting the Cost Estimation in Global Software Development (2021) | 1. Language and culture differences (15) 2. Time zone difference (14) 3. Communication infrastructure and process (12) 4. Competence Level (10) |
| Risk prediction by using Artifial neural network in global software development (2021) | 1. Cost balance 2. Failure to provide resources |
| Taxonomical classification of barriers for scaling agile methods in global software development environment using fuzzy analytic hierarchy process (2020) | 1. Lack of roles and responsibilities 2. Project size and complexities 3. Large team size |
| Empirical Investigation of Critical Requirements Engineering Practices for Global Software Development (2021) | 1. Define system boundaries (requirement scope) |

1. **Choose top factors: (factor with frequency >= 50%)**

|  |  |
| --- | --- |
| Reference Name (Year) | Factors ( number of frequency ) |
| Risk factors in software development projects: a systematic literature review (2019) | 1. Requirement ambiguity (44) 2. Requirement changes (32) 3. New technologies (30) 4. No planning or inadequate planning (25) 5. Low commitment of staff (20) 6. Staff does not have required skills (55) 7. Unstable organizational environment (30) |
| Success factors influencing requirements change management process in global software development (2019) | 1. RCM process awareness (methodology) (71) 2. Progress measure (69) |
| Empirical Investigation About the Factors Affecting the Cost Estimation in Global Software Development (2021) | 1. Language and culture differences (15) 2. Time zone difference (14) 3. Communication infrastructure and process (12). 4. Competence Level (10) |
| Risk prediction by using Artifial neural network in global software development (2021) | 1. Cost balance |
| Taxonomical classification of barriers for scaling agile methods in global software development environment using fuzzy analytic hierarchy process (2020) | 1. Lack of roles and responsibilities 2. Project size and complexities 3. Large team size |
| Empirical Investigation of Critical Requirements Engineering Practices for Global Software Development (2021) | 1. Define system boundaries (requirement scope) |

total: 145 factors before merging and filtration

total: 18 factors after merging and filtration categorized into 4 categories

**requirements factors**

**management factors**

**technical factors**

**culture factors**

* + **Requirement Factors:**
    1. **Requirement ambiguity**
    2. **Requirement changes, Change impact analysis,**
    3. **Requirements scope**
    4. **New technologies (like new programing language)**
    5. **Project size**
  + **Management factors:**
    1. **Competence level of project manager**
    2. **No planning or inadequate planning**
    3. **Low commitment of stockholders**
    4. **Progress measure**
    5. **Cost balance**
    6. **Lack of roles and responsibilities**
    7. **Team size**
  + **Technical factors:**
    1. **Staff does not have required skills (55)**
    2. **Unstable organizational environment (30)**
    3. **Methodology followed**
    4. **Communication infrastructure and process**
  + **culture factors**
    1. Language and culture differences
    2. Time zone difference