**Module 3 Critical Thinking**

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Course Code: **CSC501** (Management for the Computer Science Professional)

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**Scope Management and Deployment strategy for 3D Printer Webpage**

As a project manager for a 3D printer company, one of the primary responsibilities is to oversee the deployment of a new customer facing webpage. This site will feature a catalog of 3D printers, filaments, and servers as a key digital touchpoint for customers. This requires a responsive and collaborative approach that balances user expectations, technical precision, and time-to-market efficiency. Agile methodology offers a dynamic framework for managing scope and delivering value incrementally. This strategy outlines how Agile can effectively guide the scope management and deployment of a modern web platform, while addressing critical project needs such as usability, availability, and security.

Agile development divides the project into iterative sprints with regular stakeholder feedback and adjustments

**Project Phases**

1. **Initiation & Backlog Creation**

* Define product vision and roadmap with stakeholders
* Capture user stories and epics in a product backlog
* Identify key feature of the website for early delivery

1. **Sprint Planning & Execution**

* Prioritize backlog items and assign to sprint goals
* Conduct daily stand-ups for progress tracking
* Build, test, and integrate functional increments

1. **Final Testing & Launch**

* Conduct system testing, load testing, and security checks
* Deploy to production using CI/CD pipelines
* Monitor availability and performance post-launch
* Consider Mock deployment with simulated user requests

**Key Deliverables**

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| **Phase** | **Deliverable** |
| Brainstorming the requirement | Analyze the over all product requirements and identify the key feature to implement first |
| Project initiation | Create different categories for Product backlog, user stories and epics for UX design and development using DevOps tools |
| Sprint Planning/Execution | Incremental features: product listing page, cart, search, login |
| Review & Retrospective | Demonstrated features, updated backlog, process improvements |
| Testing | Plan the Unit testing, system testing, integration testing, load test the application. And automate the testing in every phase. |
| Final Deployment | Deployed website, test reports, monitoring dashboards |

**Tools and Skill set**

Project Management: Jira for sprint tracking and backlog grooming

Design: Adobe XD for UI/UX mockups

Development: React (frontend), Node.js/Java/Django (backend), GitHub (version control)

CI/CD: GitHub Actions, Jenkins or Azure DevOps for automated testing and deployment

Monitoring: Google Analytics, Azure log analytics, PowerBi – for live performance and error tracking

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| **Project Role** | **Technical Skills required** |
| Agile Practitioners | Scrum Master, Product Owner |
| Developers | Frontend, backend, and full-stack developers expertise in ReactJs, Adobe XD, Java or Python and Database |
| QA Engineers | Selenium, Karate, Postman and manual testing |
| DevOps/Security Engineers | GitHub, azure devOps, GitLab CICD export |

**Risks and Mitigation**

*Risk mitigation strategy.*

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| **Risk** | **Mitigation Strategy** |
| Stakeholder Misalignment | Conduct sprint reviews, maintain transparent communication |
| Security Vulnerabilities | Integrate OWASP checks, secure authentication, HTTPS, WAF |
| Downtime During Deployment | Use blue-green deployment and rollback mechanisms  Performance Bottlenecks  Perform load testing  implement CDN and caching |

**Conclusion**

Using Agile methodology for the deployment of a customer-facing webpage enables a flexible, iterative. Agile supports continuous delivery of value while reducing risk through shorter feedback loops, clear prioritization, and integrated testing. With the right tools, skilled personnel, and proactive risk mitigation, the project can deliver a secure, scalable, and user-friendly platform that supports the company's 3D printing product line and enhances customer engagement.

**References**

Google Developers – Web Fundamentals

<https://developers.google.com/web/fundamentals>

Microsoft Azure Security Best Practices

<https://learn.microsoft.com/en-us/azure/security/fundamentals/best-practices>