Southern New Hampshire University

CS-255 System Analysis and Design

Winnie Kwong

Professor Eppenger

July 8th, 2023

# CS 255 Module Two Assignment Template

## Functional Requirements

| **Functional Requirement** | **Rationale for Requirement** | **Source(s), APA format** |
| --- | --- | --- |
| User Account Management System | The user account management (UAM) system helps to manage all the user roles across the learning management system. Automated systems boost productivity, making it easier to maintain user accounts, including creating, modifying, and removing accounts. According to Indeed Editorial Team, "A UAM system can help IT departments at companies oversee who has access to what systems and accounts." (Indeed Editorial Team, 2002, para 3). This means UAM helps prevent privilege creep by only providing the access rights necessary to do one's job. UAM further also helps to increase security because it simplifies the tasks of preventing threats and data breaches that do not comply with security regulations. | Indeed Editorial Team. (2022, June 24). *9 User Access Management: Definition, Benefits and Requirements*. Indeed Career Guide. <https://www.indeed.com/career-advice/career-development/user-access-management> |
| Course Content Management | With course content management, instructors can create and organize student learning materials. Course content management makes it easier for instructors to provide distant learning courses and according to Almarashdeh, "The success of LMS in any institution starts by instructors’ satisfaction, which in turns initiates and promotes learners’ utilization of LMS" (Almarashdeh, 2016, p254). Without the ease of using LMS, instructors would not be able to provide system and service quality. Course content management also builds a bridge for communication and collaboration to deliver content data that the users are entitled to. With rapid content production, all students are granted access to all necessary course materials to further enhance their knowledge toward their career goals. | Almarashdeh, I. (2016). Sharing instructors experience of learning management system: A *technology* perspective of user satisfaction in distance learning course. Computers in Human Behavior, 63, 249–255. <https://doi-org.ezproxy.snhu.edu/10.1016/j.chb.2016.05.013> |
| Analytics and reports | Analytics and reports functional requirements to ensure metrics are accurate and help improve learning quality. Helping to analyze data directly from the source and the system can provide insight into learning behaviors, completion rates, enrolments, and rate of progression. With analytics and reports functional requirements YOUser University could offer real-time reporting to help automate data collection while decreasing manual burden. Sommerville states, "With advanced reporting and analytics, admins are able to extract trends through reports, automatically generated in real-time, and then compare those at different stages of the learning process to see learner progress and training impact." (Sommerville, 2002, para 14). Having up-to-date information feeds credibility for LMS and ensures YOUser University is on track with their learning objectives. | Sommerville, A. (2022, June 5). *Your Guide to Essential LMS Reporting & Analytics Tools*. Acorn LMS. <https://acornlms.com/resources/lms-reporting-and-analytics> |
| Assessment and Grading System | Assessment and grading system functional requirement allow instructors to create and distribute assignments, quizzes, and tests. Pepe argues, "These features enable instructors to measure student understanding, track progress, and provide essential feedback, all of which contribute significantly to the learning process." (Pepe, 2016, para 23). Having an assessment and grading system can provide a centralized location for students to track their grades and feedback on all assignments submitted. Furthermore, having an assessment and grading system includes an automated grading feature to reduce the time and effort to score assignments. With reduced time and effort to grade scores, instructors have more time to provide feedback on tasked assignments. | Pepe, F. (2023, June 29). *Guide: How does a Learning Management System work? -* Teachfloor. <https://www.teachfloor.com/blog/how-does-a-learning-management-system-work> |
| Offering a Cloud-Based LMS | Offering a cloud-based LMS will determine how learning materials are accessed. Timon argues, "A major benefit of taking your learning program into the cloud is the ability for learners to access it wherever they want." (Timon, 2023, para 10). With remote schedules, cloud-based LMS promotes continuous learning and consistency. Cloud-based LMS benefits users by allowing them to be flexible in time management while providing a safe and comfortable environment. Cloud-based software can increase scalability and productivity to help colleges and universities grow and evolve. As cloud-based software has the appearance of unlimited data and storage, YOUser University would be able to organize everything to expand learning and development needs. | Timon, M. (2023, January 9). *What is a Cloud-Based Learning Management System*. WorkRamp. <https://www.workramp.com/blog/what-is-a-cloud-based-learning-management-system/#:~:text=A%20cloud%2Dbased%20LMS%20is%20hosted%20on%20a%20server%20vs> |
| Integration with other systems | Integrating other systems as a functional requirement can streamline YOUser University to establish data flow channels. Partida argues, "A wide array of well-functioning app integrations shows that an LMS developer took the time to understand instructors' needs. (Partida, 2023, para 14). Instructors are the backbone of society that offer guidance, but without practical integrated applications, instructors cannot unlock their full potential to prepare students for success. Also, having the support of related educational applications can simplify the process for instructors and students to upload assignments and other reading materials. System integration allows all sources and storage in a single location, eliminating wait time for data to be synchronized through multiple systems. | Partida, D. (2023, March 3). *Important Features Of Learning Management Systems*. ELearning Industry. <https://elearningindustry.com/important-features-of-learning-management-systems> |

## Nonfunctional Requirements

| **Nonfunctional Requirement** | **Rationale for Requirement** | **Source(s), APA format** |
| --- | --- | --- |
| Performance and Scalability | Performance and scalability is a nonfunction requirement because it defines how fast software responds to commands. Performance can assess the system's ability to simultaneously manage increased workloads and different applications. With a faster response time, users will respond more positively to how the application functions. The performance also ensures the application is stable and can identify potential problems from occurring, which can maintain the expectation levels of the end users. Scalability can also be necessary for the restructuring YOUser University. According to Samelame, "It is thus necessary to make sure that the system can cope with a situation when the number of its users grows even several times, and the demand for new courses and dedicated training paths increases accordingly." (LMS, 2021, para 5). The development of YOUser University must be able to handle adding new departments and any other reporting that is relevant to the business. | LMS scalability: definition and why is it so important in employee training? (2021, March 22). Samelane. <https://samelane.com/blog/is-my-lms-scalable-and-why-does-it-matter/> |
| Reliability | Reliability is an essential nonfunctional requirement because it can specify the average time a system runs before a failure occurs. TechCanvass argues, "Reliability can possibly be specified in terms of average time system runs before failure occurs, percentage of operations completed successfully within a time period, maximum acceptable failure probability, or no. of failures within a time period." (TECHCANVASS, n.d., para 17) With reliability, it provides the communication that provides YOUser University with the structure it needs to access information and procedures. Furthermore, reliability allows maximum optimization for uptime to improve performance. Uptime allows a way to share documents, schedules, and directories in an adequate time. | *Non-functional Requirements and its Importance | Techcanvass Blog*. (2021, August 11). Business Analysis Blog. <https://techcanvass.com/blogs/non-functional-requirements-in-software-engineering.aspx> |
| Security | Security is an essential nonfunctional requirement because it protects sensitive data from being accessed by unauthorized users. According to Indeed, "To protect sensitive data...databases may include firewalls to prevent unauthorized access" (Indeed Editorial Team, 2022, para 8). Security measures help prevent and block unwanted IP addresses from accessing data that can potentially harm YOUser University's value. Security can reduce and prevent the amount of spam traffic that enters the application. Spam and other malicious attacks can harm or disrupt YOUser University by stealing one's personal information and using it for criminal activities. Also, security can make users feel more comfortable and secure with data safety. When users disclose personal information, users build trust within YOUser University and enhance the University's value. | Indeed Editorial Team. (2021, May 4). *9 Nonfunctional Requirements Examples*. Indeed Career Guide. <https://www.indeed.com/career-advice/career-development/non-functional-requirements-examples> |
| Accessibility | Having accessibility allows the LMS to compile with all applicable laws and regulations. Solea argues, "Providing equal training opportunities ensures all employees learn the skills and information they need to perform their jobs well, benefiting the whole organization." (Solea, 2022, para 8). Using accessibility to provide equal opportunity promotes diversity and an excellent organizational reputation. With care for current and future employees at YOUser University, accessibility can also attract instructors with mobility problems or hearing and vision disabilities. These instructors may come with elevated talents that can build an inclusive organization. Besides instructors, students with disabilities can access and interact with the system. Providing users with an LMS designed with accessibility in mind further enhances the growth of YOUser University. | Solea, L. (2022, December 7). *6 Must-have LMS features for building accessible e-learning courses - Business Blog.* <https://www.cypherlearning.com/blog/business/lms-features-for-accessible-e-learning-courses#:~:text=LMS%20keyboard%20accessibility%20allows%20learners> |
| Usability and Navigation | With usability and navigation, users can understand how the application is organized and how to access pages. According to Kebritchi et al, "Struggling with the use of technology may distract faculty and students and negatively affect learning and teaching." (Kebritchi et al, 2017, p 20) Not all instructors will be familiar with technology and may be frustrated with learning the system, which can disrupt students' learning process and hinder their studies. With navigation, users can quickly determine icons and features, such as tabbed navigation, that reduce the clunkiness of a website. With the right tools, LMS becomes more straightforward and easier to read and can help redirect users to their class recourses. With easy usability and straightforward navigation, people will want to use LMS to engage with others. | Kebritchi, M., Lipschuetz, A., & Santiague, L. (2017). Issues and Challenges for Teaching Successful Online Courses in Higher Education: A Literature Review. *Journal of Educational Technology Systems, 46*(1), 4–29. <https://doi-org.ezproxy.snhu.edu/10.1177/0047239516661713> |
| Localization | Localization helps to adapt the system to be compatible with the user's region. Offering localization offers users to feel more comfortable using the application. In Rymarenko's article, he describes not all countries use the same customs, such as reading left to right, and can help users understand the information within the system. (Rymarenko, 2022, para 21). Utilizing localization also expands knowledge to a global reach. YOUser University would be able to tap into regions that are high in demand for instructors and increase the motivation to learn. Offering localization can also increase the pace of knowledge provided to the learners. When studying in one's native language, learners will be more engaged and help to improve the instructor's overall effectiveness in one's learning course. Localization helps build trust, brand loyalty, and overall customer satisfaction. | Rymarenko, B. (2022, May 9). *Underestimated Power of Non-Functional Requirements.* Uptech Team. <https://www.uptech.team/blog/non-functional-requirements#:~:text=The%20non%2Dfunctional%20requirement%20of> |

## Assumptions

| **Assumption** | **Rationale for Requirement** | **Source(s), APA format** |
| --- | --- | --- |
| Users have basic technical skills | Users with basic technical skills will feel more satisfied with the application, help YOUser University meet their goals, and provide feedback on the current system. Andriotis states, "Employees feel less frustrated and confused because they can use the technology without getting stuck. This allows them to be more productive and efficient in their daily work." (Andriotis, 2018, para 12). When employees and end-users feel less frustrated when using the application, there is a higher return rate for end-users, which leads to trust in the business's ability to scale and evolve. Also, users with basic technical skills are more capable of helping YOUser University meet its strategic goals. With basic technical knowledge, users can clearly understand the purpose of each feature inputted into LMS. Furthermore, there is an opportunity to provide feedback from end-users about their experience with the application. With feedback, it is effective for learning because it helps to restructure any flaws within the organization. | Andriotis, N. (2018, April 30). *Four Easy Ways To Get The Most Out Of End-User Training*. TalentLMS Blog. <https://www.talentlms.com/blog/end-user-training-benefits-best-practices/> |
| Sufficient Staff Training and Support | According to Cole, "Courses are designed by an individual instructor or a professional learning designer." (Cole, 2019, para 4) If the courses are designed by an individual instructor or a professional learning designer, they will determine the outcome of knowledge distributed to the user. If the instructor or designer fails to provide adequate knowledge, it hinders the learner's education. Also, training the staff ensures the system's features and functionality deliver properly to end-users. Without staff knowledge, there can be a failure in communication that affects the learning in passing the class. | Cole, J. (2019, August 12). *What the state of learning management systems can tell us about digital innovation*. Learning Futures. <https://medium.com/learning-futures/what-the-state-of-learning-management-systems-can-tell-us-about-digital-innovation-bddfb613332a#:~:text=These%20assumptions%20include%3A> |

## Limitations

| **Limitation** | **Rationale for Requirement** | **Source(s), APA format** |
| --- | --- | --- |
| Technical and programming knowledge background | Having technical and programming knowledge background will determine the quality of LMS. GoGuardian Team states, "... a massive drawback to having a learning management system is that your organization will need coding and IT skills to customize the platform to suit your training needs" (GoGuardian, n.d., para 8). Without proper platforms, the overall functionality can suffer from critical issues such as connectivity and other efficiency issues. Also, technical and programming knowledge would determine the technical compatibility between various devices and browsers. Having successful access between devices and browsers would limit the number of users accessing the website and lose potential learners from applying. Having technical and programming knowledge background will determine the quality of overall platform maintenance to meet user satisfaction. | *Pros & Cons of Learning Management Systems | GoGuardian*. (n.d.). Www.goguardian.com. <https://www.goguardian.com/blog/learning-management-systems-pros-cons#:~:text=Requires%20IT%20and%20programming%20knowledge> |
| Dependency on internet connectivity | Dependecy on internet connectivity determines the quality of education for students. According to Matte, "...students who work and live in rural communities are faced with poor internet connections, as well as lack of infrastructure." (Matte, 2020, para 2) Students may find difficulty in submitted assignments because of unstable internet access and can further hinder their education. Internet dependency disrupts educators from providing learning materials for students and makes it challenging for users that are remote or other areas with limited internet infrastructures. | Matte, R. (2020, October 18). Students with poor Internet left behind in online learning atmosphere. The Fulcrum. <https://thefulcrum.ca/sciencetech/students-with-poor-internet-left-behind-in-online-learning-atmosphere/> |