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Challenges and Obstacles in Implementing the CIMS System at UTAS Oman

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Abstract

Like any new and newly used system, the College Information Management System (CIMS) faces some obstacles that have a negative impact on university systems and workflow. Over the past two years since the implementation of the College of Information and Management system in applied universities, many of the problems associated with it have emerged, which led to the holding of many introductory and practical workshops for the possibility of repairing some of them or finding solutions to others. In this research paper, some CIMS problems have been presented based on how the issues appeared to academic advisors and instructors during the registration period, then discussed to obtain proposed compromise solutions to avoid the reappearance and to expand knowledge on how to solve them if they reappear. The positive available impact of the system with fewer issues and concerns would define a future outlook for the possibility of developing such a system for the benefit of work and reducing the burden on the academic advisor. In conclusion, most problems were solved with 85% to 90% per cent of their total appearances in each category with the possibility of occurrence in the same period that previously appeared.

Keywords: CIMS; Information and Management system; Education; academic advisors; event scheduling

1. Introduction

The information management system is used to process and manage the data of university and college students at a high level of performance regarding the sensitive cycle of meeting study and work requirements. Using an extraordinary system for university admissions is common and in demand at the same time because of its ability to facilitate the usual student procedures. It is known in all local and international universities and colleges, despite the difference in the type of system used. These systems provide many important features for students, lecturers and

university employees, such as registering academic subjects, knowing the percentages of absences and their timing for students, and filling out a form for deletion, addition and postponement. As for lecturers, they rely on the system to register student absences, download student lists, track all student data from the first semester, respond to student requests and much more. Universities rely on this system almost wholly; work becomes complex and lengthy without it.

The CIMS system is approved by the University of Technology and Applied Sciences in all its branches. It is a modern system that replaced another old system. This is the case with the development of the systems. Whenever a new system is created with additional features not found in the used system, it is replaced by a newer system with more features, such as easy-to-use and user-friendly. Over the years, researchers have been racing to develop and update management systems in the field of postgraduate studies and, on the one hand, to strive to create systems with high capabilities to program management laws and facilitate workflow. This is similar to the CIMS system that is recently used to manage student data better than before (Dong & Chen, 2010), (Laudon & Laudon, 2004)

Each system has its lifetime to be used within a cycle that might be changed for any updates or cancelled due to certain reasons, such as maintaining the system is more costly than developing a new one. There is a focus on management information systems, which leads to a general conclusion that there is a definite relationship between information systems and human resource management in any public or private business entity, which has advantages over individuals and management principles. The knowledge management system was introduced by (Alavi & Leidner, 1999), where the issues, challenges and benefits of such a system were analyzed and studied. All the previous studies were on knowledge management systems as a new system (Bartlett, 1996), (Henderson and others, 1997) for managing the data, where conceptual principles on how the system works existed in specific organizations only (Davenport, 1997; Davenport & Hall, 2002), (Baird, Henderson & Watts, 1997). Information technology plays a major and major role in managing the principles of education which would serve the interests of students in educational institutions (Schuh & Gansemer-Topf, 2010). There is no doubt that there is rapid progress witnessed by higher education institutions, which are closely linked to the use of the latest electronic technologies that can activate and stimulate education in addition to other advantages of facilitating service, improving performance, achieving goals and the general vision of these institutions. Depending on the development of the systems and technologies used in the institutions, all higher education institutions can find themselves a suitable place that suits their ambitions and aspirations for a better future (Briki, Ali, & Khan, 2019).

College staff are also keen to learn and introduce modern technologies to help the student community and improve their performance. In order to improve student performance and serve their community, college staff are keen to learn and familiarize themselves with modern technologies to advance and advance at local and global levels in a way that serves the interests of students and employees. (Al-Belushi & Khan, 2017) Khan and Al Balushi pointed out that most employees of educational institutions seek to master their work without any financial benefits added to them. On the contrary, they improve their performance continuously, but they need support and motivation from their managers to give, excel, and innovate (Hooda et al.,2024). The Ministry of Manpower in the Sultanate of Oman has provided the Colleges of Applied Sciences and Technology with accurate and effective systems in order to complete the work related to transactions with greater accuracy and effectiveness. All of this serves the public interest and encourages

competition aimed at using everything that facilitates work and accomplishes it with efficiency and mastery from modern technologies and advanced information systems. The Ministry provides the College Information Management System (CIMS) to the Universities of Technology and Applied Sciences in all its branches, including the University of Technology and Applied Sciences in Suhar, which contains many applications related to managing employee and student data. The faculty members also use these applications to perform many diverse tasks. The tasks facilitated by this system are: registering subjects for students and providing them with advice, recording and printing the timetable and entering a timetable for college employees, preparing expectations for the upcoming semesters, entering and checking grades, creating records for students and employees, preparing a list of graduates and the deans' honour roll, preparing lists of students under observation due to their poor academic performance and sorting them into three times according to the semesters, provided that they are consecutive, which is being under observation for the first time, followed by being under observation for the second time, and then being under observation for the last time.

All colleges and universities have an academic advising system that plays a major role in evaluating and assessing the educational path of students. This system consists of members and a head of the system, who have periodic meetings to discuss the status of students under observation and to spread sufficient awareness of the academic system to new students and lecturers. They also have a great role in developing treatment plans for students starting from the registration stage, following up on their grades and absence rate until the end of the semester, and knowing the extent of their improvement.

Therefore, the academic advising system has gained great popularity at the present time among universities in terms of expressing opinions, providing advice to students and engaging them in activities that contribute to their education (Hsu, Marques, Ilyas, & Ding, 2002).

The academic advising system relies on the CIMS system in terms of showing the status of students under academic probation and the number of occurrences, their absence rates, grades, certificates and many others. The CIMS system is a smooth and flexible system to use, but it needs to adjust some operations that would facilitate and serve the work in a manner that suits the academic environment, as many problems have appeared that have hindered the workflow and sequence, whether for students, academic advisors, faculty members or administrative staff, which resulted in difficulties and obstacles that need to be studied to understand them and then programmed internally. Among these problems are the error in calculating the number of times one falls under academic observation, the error in producing reports in general for some tasks, the inability of the advisor to add courses due to their unavailability in the system, and the display of an error in the grade entry report in terms of the actual grade of the student's grade. Many other branches of the University of Technology and Applied Sciences have reported problems similar to those at the University of Technology and Applied Sciences - Suhar Branch. A Part-of-Speech (POS) tagger for Arabic enhances CIMS at UTAS Oman by automating linguistic analysis, accurately parsing student inquiries, and improving automated responses using robust bootstrapping technique, addressing Arabic's unique grammatical challenges to support efficient academic advising and student guidance (Yousif & Al-Risi,2019; Yousif J., 2018; Uraibi et al., 2009).

Problems are dealt with when they arise in all their forms by reporting the problem either in writing by writing an email or verbally by calling or going in person to the person in charge at the Admission and Registration Center. The Admission and Registration Department also created a special email to send system-related problems. Then, the person

in charge collects similar problems and tries to solve them if possible. If not, the main branch of the university in Muscat must be notified, and solutions must be sought from other branches. However, until solutions are found for the problem, the process is suspended and waiting for it to be solved. This affects the workflow as the transaction cannot be completed. Sometimes, when the problem is solved, another problem appears, which also needs another solution. Sometimes, employees resort to using temporary solutions until a permanent solution is found, such as the problem of calculating the grades that the student must obtain in the selected courses to get out of academic probation. These were some of the reasons that led to conducting statistics and studies on the problems of this system (Yousif et al., 2021).

2. Background & Literature Survey

The Khan and Al-Balushi (Al-Belushi & Khan, 2017) conducted a study about how to evaluate the effectiveness of the College Information Management System (CIMS) in the registration process and academic advising processes at the University of Technology and Applied Science- Shinas. Specifically, the research seeks to assess how efficiently CIMS supports these administrative functions and whether it meets the operational needs of students and faculty. Additionally, the study examines the key functions of CIMS, focusing on its capacity to fulfil its intended roles in streamlining academic processes. The method utilized in their research was conducting a survey about how to examine the effectiveness of CIMS on 180 members form the faculty where staff and students were involved. Then, the data was gathered and analyzed using SPSS. The study reveals that the College Information Management System (CIMS) at the University of Technology and Applied Science- Shinas is a highly functional and versatile platform that meets the needs of various users, including students, faculty, and administrative staff. One of the key strengths of CIMS is its user-friendly interface, which allows for easy navigation and seamless interaction, even for individuals who may not be highly tech-savvy. Additionally, the system is flexible, allowing it to adapt to the changing needs of the institution and its users, making it an indispensable tool for managing academic processes such as registration and advising. The system has largely met the expectations of its users, who have reported satisfaction with its performance and functionality. Most users found that CIMS effectively supports the academic processes for which it was designed. However, despite its overall success, a few technical issues have been identified that could benefit from improvement. These issues mainly concern system glitches, occasional slowdowns, and some inconsistencies in data handling, which, if addressed, could further enhance the user experience and system efficiency (Aral et al., 2012). A critical factor contributing to the system's reliability is the continuous monitoring and maintenance provided by the Educational Technology Center (ETC) at the Shinas branch. ETC ensures that CIMS operates smoothly, securely, and safely by implementing stringent measures to protect against external attacks, data breaches, or system failures. This ongoing vigilance ensures that users can rely on CIMS for secure and uninterrupted access to essential academic services, contributing to its effectiveness. Furthermore, the Educational Technology Center plays an essential role in regularly assessing CIMS to detect any vulnerabilities or performance issues. This proactive approach includes periodic follow-ups and updates to the system, ensuring that it remains secure and functional over time. The commitment of the ETC to keeping CIMS protected from external threats, along with the system's periodic evaluations, is seen as a positive and reassuring aspect by users, as it guarantees both operational continuity and the

protection of sensitive student and faculty data. In conclusion, CIMS has proven to be a vital tool at the University of Technology and Applied Science- Shinas, facilitating key academic functions while maintaining flexibility and ease of use. While there are minor technical issues to address, the system overall has fulfilled the expectations of its users. The continuous support and monitoring provided by the Educational Technology Center further strengthens the system's credibility and reliability, making CIMS an essential asset for the college's academic operations (Strickley, 2011).

While the study provides valuable insights into the effectiveness and functionality of the College Information Management System (CIMS) at the Shina branch, it also acknowledges several limitations and suggests areas for further improvement. These limitations may affect the generalizability of the findings and the full extent to which CIMS can be optimized to serve all users effectively. One of the primary limitations highlighted by the study is the potential gap in user knowledge regarding system updates and new features. Although CIMS is generally user-friendly and efficient, users may not always be fully aware of recent updates or improvements to the system. As CIMS evolves with new functionalities and modifications, it is crucial that users are adequately trained to understand and effectively utilize these updates. The study suggests that regular training sessions should be provided for users to ensure they are familiar with any changes and can make the most of the system's features. Such training could focus on practical aspects, such as navigating new interfaces, understanding new tools, and using additional functionalities that may enhance the academic advising and registration processes. Additionally, (Munirat et al., 2014) the study highlights the importance of continuous training for the CIMS maintenance crew, which plays a critical role in ensuring the system's smooth operation. The maintenance crew is responsible for troubleshooting, system updates, and ensuring the software remains secure and functional. Given the technical nature of these responsibilities, it is vital that the maintenance crew receive ongoing training to stay updated on the latest developments in software management, cybersecurity practices, and troubleshooting techniques. This would reduce the likelihood of system malfunctions or performance issues and enable the maintenance team to respond more efficiently to technical challenges. Moreover, the study suggests that improvements in communication between the CIMS users (faculty, students, and administrators) and the Educational Technology Center (ETC) could further enhance the effectiveness of the system. Clear channels for feedback, reporting issues, and suggesting improvements would help ensure that CIMS continues to evolve in line with the needs of its users. Additionally, providing users with clear guidelines on reporting system issues, tracking system updates, and understanding maintenance schedules could further reduce user frustration and improve overall satisfaction. Another noted limitation is the reliance on self-reported data from users. While surveys and questionnaires provide valuable insights, they are subjective and may not always reflect the full range of user experiences. The study could have benefited from incorporating other data collection methods, such as interviews, direct observations, or system usage logs, to provide a more comprehensive picture of how CIMS performs in real-world scenarios. This helps mitigate any biases or inaccuracies that arise from user-reported feedback. Lastly, the study is limited by its scope, focusing only on the Shinas branch. While the findings are valuable for this specific institution, they may not be directly applicable to other colleges or universities with different infrastructures, user populations, or technological needs. Future research could expand the scope to include other institutions, providing a more generalized understanding of how CIMS performs across different educational contexts (Vogel-Heuser et al., 2015).

Another study was conducted by Al-Qayoudhi (Al-Qayoudhi et al., 2017). Their study aimed to assess the effectiveness of the systems, processes, and practices at the University of Technology and Applied Science-Shinas and propose a framework for future enhancements based on quality criteria. Additionally, the study seeks to provide recommendations for various operational areas in alignment with the standards of OAAA institutional accreditation. A survey was conducted as a method, and a sample for this research consisted of 50 students, 33 faculty members, and 16 management staff. Data was gathered using a structured questionnaire. Students from the Departments of Engineering, Business, and Information Technology were selected through stratified random sampling, while the staff was chosen using simple random sampling. The survey results indicated that the systems and practices at the Shinas branch largely conform to OAAA (Oman Academic Accreditation Authority) standards, except in areas related to staff promotion and incentives. The ADRI analysis and the review of the SAR, QAR, and QIP show that Shina's branch practices regarding management, staff, and students are consistently evaluated and well-established. This study emphasized the critical role of quality assurance in higher education, positioning it as the foundational element for enhancing institutional performance and meeting accreditation standards. By examining the current practices at the Shinas branch, the study highlighted key areas where improvements can be made to better align with the OAAA national accreditation criteria. These improvements focused on enhancing operational efficiency, ensuring continuous assessment, and refining management, staff development, and student engagement processes. One of the practical implications of the study was the identification of gaps in staff promotion and incentives, which can be addressed to improve employee satisfaction and retention. Addressing these gaps was essential for fostering a motivated and committed workforce, which in turn will positively impact on the overall academic environment. Furthermore, the study's findings suggest that the Shinas branch should continue refining its monitoring and evaluation mechanisms to ensure that practices related to quality assurance are not only compliant with OAAA standards but are also continuously evolving to meet emerging challenges in higher education. It also emphasized the importance of a systematic approach to quality improvement, recommending that the branch focus on developing a comprehensive action plan for future enhancements. This includes incorporating regular feedback from students, faculty, and staff to create a culture of continuous improvement. By aligning future operational strategies with OAAA accreditation standards, the branch can enhance its academic offerings, improve institutional governance, and ensure the overall success and sustainability of the college. In conclusion, the practical implications of this study provided the Shinas branch with a roadmap for achieving higher levels of quality in its operations and practices, ensuring that the institution remains responsive to the evolving needs of its stakeholders while maintaining high standards of excellence in education.

Many studies, research, and practical and scientific laboratory experiments have been conducted on different models and samples of systems similar to the SIMS system and approved by various colleges and universities in the Sultanate of Oman. Among these systems is the Learning Management System, which is used to study its effective role and the extent of its impact on the educational process. Nair (Nair et al., 2012) conducted a study on the learning management system. In contrast, the system used in different universities and colleges in Oman was discussed to determine its utilization and impact. Based on their research, University colleges in Oman have adopted the latest e-Learning Management Systems (LMS) to stay at the forefront of the ongoing technological revolution in higher

education. However, it is imperative to rigorously assess the true impact of these systems within the university colleges. As the researcher is affiliated with Muscat College, this study was conducted to critically evaluate e-learning technologies' influence. This paper investigates the significant effects of LMS on students, examining its transformative impact on their academic engagement and performance. A detailed questionnaire was crafted during the 2008-09 academic year and distributed to students enrolled in various Bachelor (Honours) degree programs at the University of Stirling, UK, which is Muscat College's partner institution. The survey results raised important concerns, prompting the researcher to extend the study through the academic years 2009-10 and 2010-11 to comprehensively understand the enduring impact of LMS on students at the college (Nair & Patil, 2012). Another system studied by a group of students (Balasaheb et al., 2015) is College Management Software, which was a web-enabled platform designed for specific purposes, which is to streamline and manage the entire operations of an institution. This software serves as a unified, integrated system that connects various departments within the institution, such as Administration, Accounts, Student Services, and other specialized modules. Over time, it has been observed that the processes of maintaining notice boards and disseminating important academic notifications have been carried out manually across educational institutions. Therefore, it has proven to be not only time-consuming but also inefficient. Today, the need to maintain paper-based notice boards has been rendered obsolete, and the system has incorporated web-based technology that facilitates the delivery of notifications from institutions. The methodologies were used on a system based on web services developed and implemented on Android mobile applications and PCs, enabling communication with a remote server's database. A Unique ID (UID) system has been introduced, providing distinct identification numbers to system users. This UID number not only assists administrators in tracking individuals but also simplifies the user experience by eliminating the need to submit multiple documents, as they are readily available.

Al-Jaraiyda (Al-Jaraiyda & Al-Areimi, 2010) Conducted a study to assess the effectiveness of Information Technology Systems in the Colleges of Applied Sciences in Oman. To achieve the goals of the research, the researchers developed a comprehensive evaluation model to gauge the efficiency of these IT systems within the institutions, based on the framework established by Al-Jaraiyda. The study was conducted with the participation of deans, assistant deans, and department heads, totalling 56 individuals. The findings revealed that the efficiency of Information Technology Systems in the Colleges of Applied Sciences in Oman is considered high. Furthermore, no significant statistical differences were found among the evaluation scores of the study participants concerning the efficiency of IT systems in these colleges, irrespective of their educational qualifications or work positions. Based on these results, the researchers put forward several key recommendations: First, it is essential to continuously update the information pertaining to employees working in the Colleges of Applied Sciences to ensure smooth and efficient operations. Second, the development and design of application software should be handled by the IT personnel within the colleges, ensuring that the systems are tailored to meet the specific needs of the institutions and are aligned with evolving technological demands.

Many research studies have emerged, including research to expand the scope of understanding of how to develop systems to suit the work environment and reduce the obstacles and problems resulting from the modern use of systems with the amendment of the regulations and laws followed by the educational institution. Therefore, we created this study to limit the obstacles and problems and find solutions for them by suggestion or application. This requires direct

communication with the system programmer on an ongoing basis. Also, the basis of this study and limiting the obstacles is to avoid their occurrence in the future or to know the main reason leading to their occurrence and solve it as soon as possible. A summary of literature studies is presented in Table 1.

Table 1. A summary of literature studies

Author & Year	Method	Findings	Problems/Disadvantages
Al-Belushi & Khan (2017)	Survey of 180 faculty, staff, and students. Data analyzed using SPSS.	CIMS effectively supports registration and advising with a user-friendly interface and flexibility. Users report satisfaction.	System glitches, occasional slowdowns, data handling inconsistencies. Users may lack knowledge of system updates and features.
Al-Qayoudhi et al., (2017)	Survey of 50 students, 33 faculty, and 16 management staff. Stratified and simple random sampling.	Systems at Shinas branch meet OAAA standards but lack in staff promotion and incentives.	Gaps in staff promotion and incentives. Limited communication between CIMS users and Educational Technology Center (ETC). Key areas for improvement include quality assurance and operational efficiency.
Balasaheb et al., (2015)	Implementation of College Management Software using web services on Android and PCs.	Integrated system improves notification dissemination and streamline operations. Unique ID (UID) enhances user tracking and reduces paperwork.	Dependency on technology and web-based systems. Initial setup and user training are resource intensive.
(Vogel-Heuser et al., 2015).	Review and analysis of SAR, QAR, and QIP in compliance with quality assurance criteria.	Highlighted gaps in management practices, suggesting improvements in staff incentives and promotion to enhance satisfaction and retention.	Lack of structured feedback channels between faculty, students, and management. Limited resources for consistent quality assurance evaluations.
Munirat et al. (2014)	Analysis of system maintenance and user training needs in educational institutions.	Emphasized the importance of continuous training for CIMS users and maintenance teams to ensure efficiency and reliability of operations.	Insufficient training for maintenance staff. Poor communication of system updates to users, leading to underutilization of new features.
Nair & Patil (2012)	Questionnaire-based survey over three academic years (2008–2011) to assess LMS effectiveness.	LMS significantly improves student engagement and academic performance. Study highlights the transformative	Initial LMS implementation faced user adaptation challenges. Limited assessment of long-term user satisfaction and technological upgrades.

		potential of e-learning technologies in Oman.	
Dr. Sarachandran Nair & Dr. Rajendra Patil (2012)	Survey-based study over multiple academic years at Muscat College.	LMS enhances student engagement and academic performance, demonstrating the transformative impact of e-learning technologies in higher education.	Challenges in adapting to new technologies. Limited focus on long-term evaluation and updates for user satisfaction.
Strickley (2011)	Survey and structured interviews to assess operational efficiency in information systems.	I identified the need for better communication between stakeholders to address gaps in user satisfaction and optimize academic processes.	Heavy reliance on user-reported data, which may introduce biases. Inadequate mechanisms for addressing user feedback promptly.
Al-Jaraiyda et al., 2010)	Comprehensive evaluation with 56 deans, assistant deans, and department heads.	IT systems in Colleges of Applied Sciences in Oman are efficient, supporting operations effectively. Recommendations include updating employee data and designing tailored applications.	Lack of periodic updates to IT systems. Application software development not aligned with specific institutional needs.

3. Research Methodology

3.1. Data Collection & Analysis

By With the help of the Admission and Registration Center, a special email address was created to send problems and obstacles that hinder the process of adding courses for students in various specializations as part of data collection. This is to improve the problems for a number of goals, including making them a general problem rather than a specific one, and then finding solutions for them either by programming the solution or finding an alternative solution. As for the problems that cannot be solved at present, they are collected in one file and then sent to the main branch in Muscat. We will present some of these obstacles. The problems have been listed and analyzed under the following categories:

- Problems with student registration
- Problems with creating reports
- Problems with calculating the cumulative average
- Problems with estimating the grades of students (under academic probation) for the last time

3.1.1. Category 1: Problems with student registration

This problem was reported by all academic faculty members in the two colleges, the College of Engineering and the College of Information Technology at the University of Technology and Applied Sciences. The number of emails received was limited to more than 200 emails, but for the sake of specificity only a small sample of about 100 reporting

cases was taken. We mention some of them: Since the academic advisor is responsible for studying the student's plan and adding the courses that he must study before starting the course registration process by the student, the problem of the courses that must be added to the student did not appear, so the academic advisor was unable to add any course, and thus the situation was reflected on the student, as he was forced to meet the academic advisor in person to discuss the reason for the obstruction of the registration process. Also, one or two courses did not appear for the advisor while adding courses, despite the presence of the rest of the courses, which happened to a small group of students, about 30 cases only, which led to the appropriate classes being filled at the time with the students' free time. Figure 1 shows the number of CIMS students with registration problems.

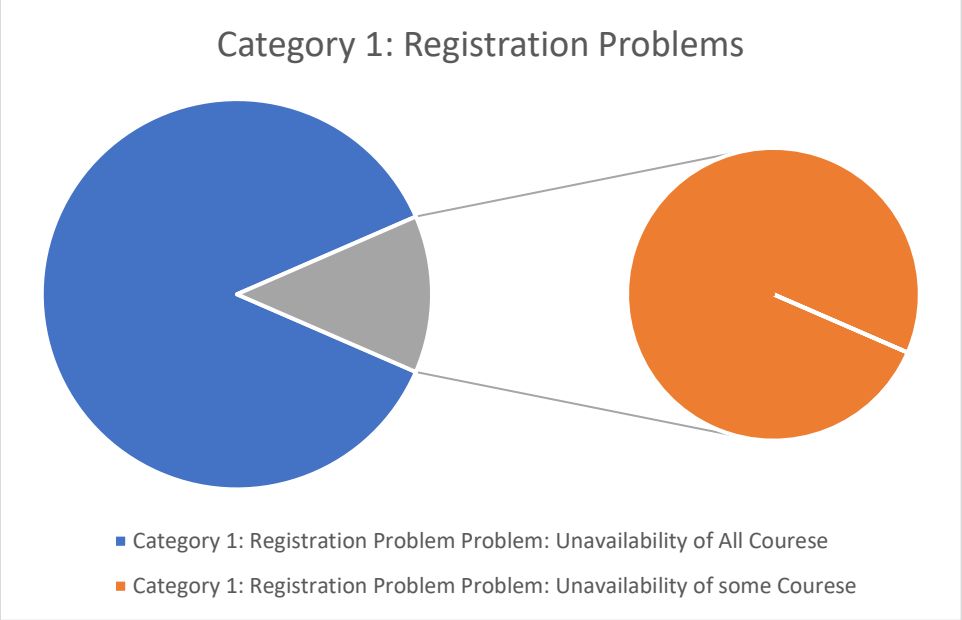

Figure 1. Registration Problems

3.1.2. Category 1: Problems with creating reports

Among the problems reported regarding the generation of reports is the lack of response of the CIMS system to generate a report that includes data on students under academic probation and the inability to detail them into any type of academic probation. There are three cases of being under probation: the first time, then the second time, then the last time, over the course of three consecutive semesters without any exit or exception. To know how a student can fall under academic probation, it is by calculating the student's cumulative average, which the system also failed to determine for some students, and this is also another problem that we will discuss later. A student falls under probation if he obtains a cumulative average of less than 2 due to failing a certain course or being deprived of writing the final exam due to a high rate of absence in the course or obtaining a D grade, which is less than 60 degrees, and this is inconsistent with the passing grade, as the passing grade for courses is 60+. When the system fails to create an important report such as this report and other reports, this harms the course registration process because it is an important part of knowing the courses that must be repeated to get out of probation, and since the number of times of repetition is limited to only two academic times during the diploma stage, the advisors focus on the student's report to build a plan aimed at improving the student's level. For example, if the total number of students under observation is

95 students out of a total number of 501 CIMS students, the system should generate a report detailing the student's data, specialization, number of times he/she was observed, and his/her cumulative GPA, which the system failed to generate. This leads to another problem, which is that when the aforementioned problem was solved, the workers faced another problem, which is the system's inability to classify the number of times he/she was observed, and thus it also affected the registration process.

3.1.3. Category 3: Problems with calculating the cumulative average

We mentioned this problem before, but we will discuss it in detail here. This problem appeared when there was a need to know the students' cumulative GPA so that the student can study 6 courses in one semester, provided that his GPA is very good. The academic advisor also needs to know the GPA for students under observation so that four courses are added in one semester instead of five courses due to the student's poor performance. When the admissions and registration staff tried to extract the students' GPAs, they found a big difference between the actual GPA and the GPA that the system created. We can mention an example of this, which is the presence of approximately 150 students with an incorrect GPA out of 501, and this is a significant number as shown in Figure 2.

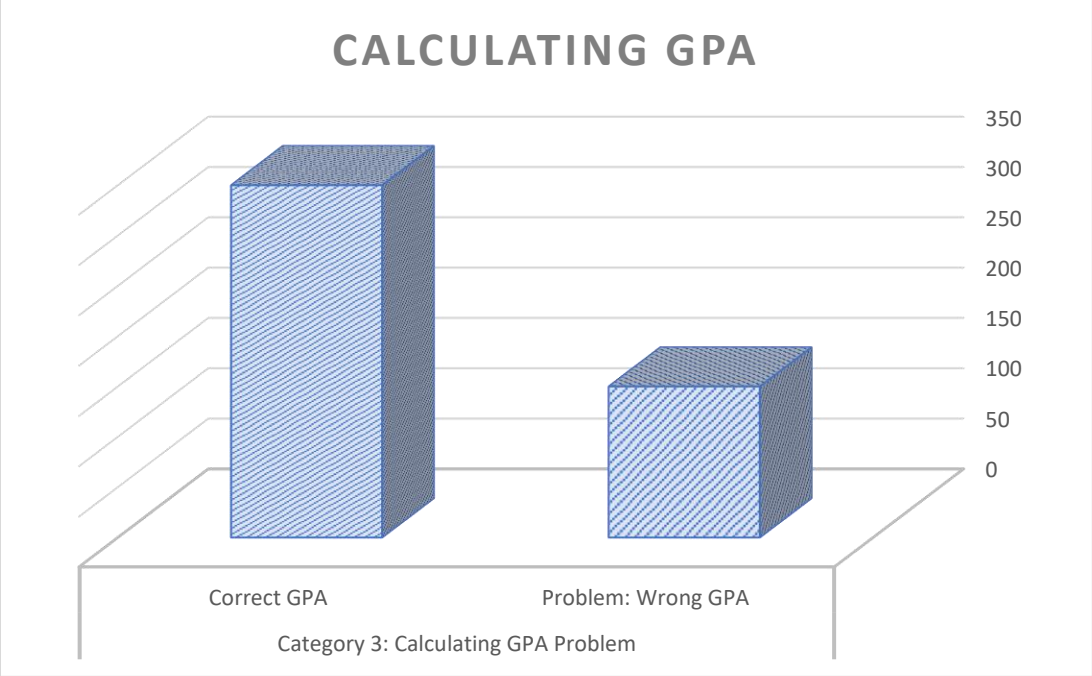

Figure 2. Calculating gpa

3.1.4. Category 4: Problems with estimating the grades of students (under academic probation last time).

As part of the work of the Academic Guidance Committee, treatment plans are developed for students under observation and discussed at the first meeting of the committee, so that the number of students under observation is

determined for the last time and their courses are determined and discussed with the advisor responsible for the student so that he is aware and informed in advance of the student's situation and what he should do to calculate the average that the student is supposed to obtain in each course to get out of observation. Unfortunately, the SIMS system is not programmed to develop treatment plans for students, and the advisor must communicate with the Admissions and Registration Center and the Academic Guidance Committee to know the progress of work and what he should do in such cases. To conclude the discussed CIMS problems with approximate samples were illustrated in Figure 3.

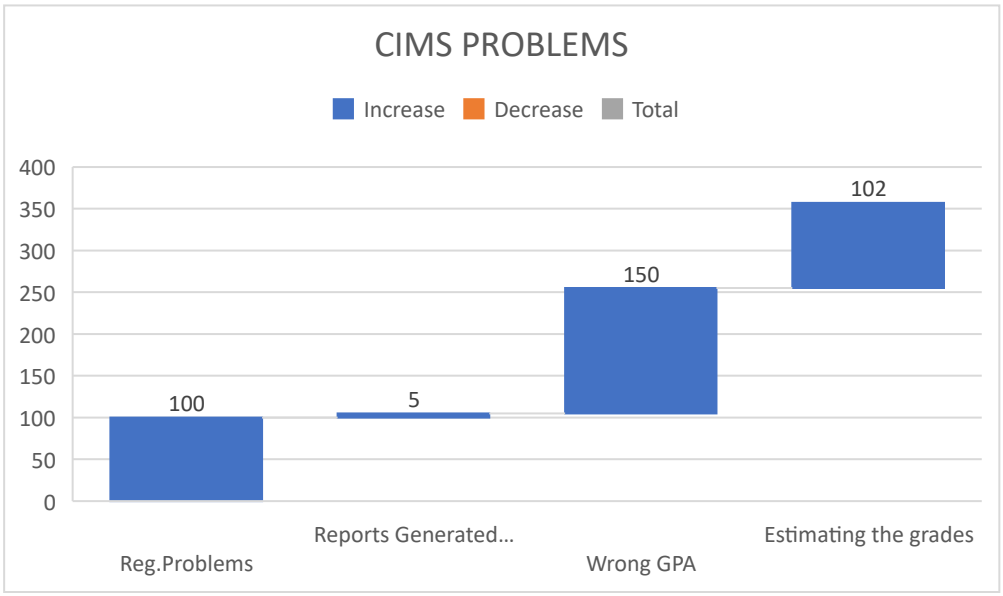

Figure 3. All Problems with their statistics

3.2. Problem Solving Methods

In order to find logical solutions to the obstacles facing the system, they had to appoint a team of employees from the Admission and Registration Center and conduct several individual visits as interview meetings to understand each problem individually. First visit: The team headed to the Admission and Registration Center at the University of Technology and Applied Sciences, Shinas Branch, and met with officials and discussed most of the problems that were collected and reached solutions to some of the problems with good and satisfactory results for everyone, which are summarized in the following table. But unfortunately, there were other obstacles that did not appear in the same system at the Shinas Branch, which required another visit. Second visit: The team headed to the University of Technology and Applied Sciences in Muscat, where they presented the obstacles and problems they faced and found similar problems and issues and learned how to deal with them and solve them when they occurred. There were also

problems that could not be predicted, and their cause could not be known except by individual diagnosis of all students individually.

4. Results & Discussion

Based on the interview meeting and discussion between the Suhar branch and Shinas branch, they tested the collected sample of Suhar branch each student in each problem individually. What they found interested them in the nature of the SIMS system, as they found that the samples were similar in some points in terms of the semester and the student mixing between the subjects of the two semesters in one year.

In the registration problem, they found that the CIMS system does not recognize IT students or engineering students due to the student not being transferred from the foundation year to the required specialization. As a result, at the end of each semester, the admissions and registration staff must change the data entered in the student's case to the specialization that each student wants to study individually. Thus, the problem of adding courses to students by the academic advisor is solved in this way. Furthermore, with the issue of having missing courses from the list of courses, they found that the student is of mixed level, which means that the student has not completed all year one courses. Therefore, to allow the student to register for any more courses from year two, the course code and course title should be sent to the registration department and then they send it to the system programmer. In short, all problems regarding the registration have been solved and the employee has been trained on similar issues. So, 100% of registration problems were solved and the students completed their registration successfully.

Regarding the problem of creating and detailing reports, a final solution was not reached with the Shinas branch, so they went to the main branch in Muscat and presented the problem and discussed it with other problems, including the incorrect calculation of a student's cumulative average. As a result of their discussion and experimentation on samples taken from the Suhar branch, they found that reports should be defined by their creation criteria so that the search criteria match the data stored and programmed according to the laws and regulations of the CIMS academic system. For example, the system was not programmed to calculate only two repetitions of a course that was studied three times. As a result of the experiment, the new rules of the system were reprogrammed. As for the incorrect calculation of the cumulative average for some students, it is still under study according to the last workshop held on November 28.

The problem of predicting the grades that a student must obtain in the courses required to be registered to get out of academic probation or to improve the cumulative average was discussed, so that each branch of the University of Technology and Applied Sciences would use a tool that performs the required task. Therefore, the Suhar branch programmed an excel file with mathematical operations that calculate the cumulative average of the courses before registration, considering the new rules of the system, such as the number of times of repetition and the number of semesters for each stage. Thus, most of the problems were solved with 85% to 90% percent of their total appearances, with the possibility of their reappearance or mutation depending on the student's situation. Figure 4 shows the accuracy of the results they achieved for each problem, while continuing to find other solutions in the future.

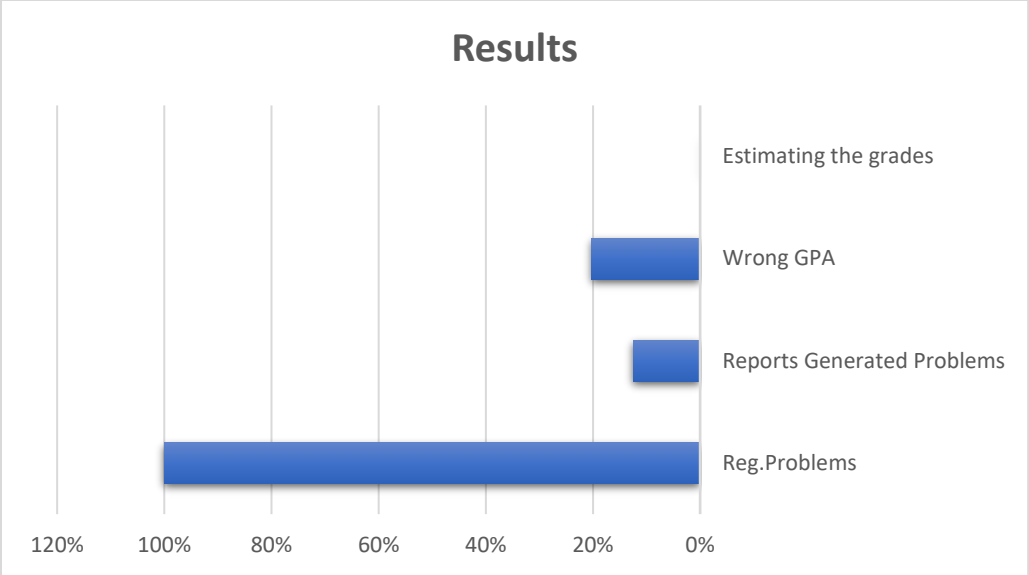

Figure 4. Results of mentioned problems

5. Conclusion

In conclusion, the CIMS system is a new system at the University of Technology and Applied Sciences, Suhar Branch, as it has been used for about two years. Every year, as students move to advanced stages in their studies, new obstacles appear that were not considered. Therefore, this study was based on the possibility of identifying some of the problems that occurred over the course of two years and how to deal with them and solve them based on the available data. It is expected that those working on the system will need another year to two years to solve all the problems permanently, with the possibility of them appearing in another form, but what was identified of obstacles and problems in this scientific paper is an achievement of continuous successes.

Future Directions

- Enhanced System Automation:

Automating repetitive tasks such as transferring students from the foundation year to their specialization and registering missing courses will streamline operations and reduce manual interventions. AI-driven tools could be implemented to identify patterns and automatically recommend solutions to recurring issues.

- Improved Registration Processes:

The registration system should be upgraded to automatically recognize students' progress and specialization transitions. This includes integrating real-time tracking of academic progress and ensuring prerequisites are validated during course registration, minimizing manual adjustments by staff.

- Dynamic Report Generation:

Developing advanced tools for creating and detailing reports is a critical next step. A flexible reporting module that allows staff to define and modify search criteria based on evolving academic rules will address issues such as cumulative GPA calculations and course repetition rules. Collaboration between branches to share best practices and solutions should continue.

- Predictive Analytics for Academic Success:

Incorporating machine learning algorithms to predict grades and identify the courses required to improve a student's cumulative GPA or exit academic probation would be transformative. This predictive tool can be directly integrated into CIMS, providing real-time insights to academic advisors and students.

- Unified System Framework:

Establishing a centralized framework across all the University of Technology and Applied Sciences branches will ensure consistent system behaviour and reduce discrepancies. This includes harmonizing programming rules, standardizing reporting templates, and streamlining data entry protocols.

- Robust Error-Handling Mechanisms:

Implementing robust error-detection and resolution protocols within CIMS will ensure faster identification and rectification of issues, such as incorrect GPA calculations or missing course data. Real-time alerts and logging mechanisms can help programmers address problems proactively.

- Long-Term System Development:

Future upgrades should focus on scalability, enabling CIMS to handle larger datasets, diverse academic scenarios, and the evolving requirements of the institution. Integrating AI, machine learning, and advanced analytics will ensure the system remains future-proof.

By addressing these directions, the University of Technology and Applied Sciences can ensure that CIMS continues to meet the needs of students, staff, and faculty while adapting to the dynamic challenges of academic administration.

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