

## **COURSE REGISTRATION SYSTEM: THE WAY MOVING FORWARD**

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<b>ARTICLE INFO</b>	<b>ABSTRACT</b>
<p><b>Handling Editor: Rahimah Mahat</b></p> <p><i>Article History:</i> <i>Received 8 July 2023</i> <i>Received in revised form 2 September 2023</i> <i>Accepted 7 October 2023</i> <i>Available online 1 November 2023</i></p> <p><b>Keywords:</b> CRS, Course Registration System, Lean Healthcare, Lean Digitalization, VSM.</p>	<p><b>Background and problem statement:</b> The course registration process plays a pivotal role in ensuring a smooth flow for the registration journey. However, traditional registration systems often suffer from various limitations, leading to frustrations, inefficiencies, hindered registration progress, and delayed getting the response, invitation letter, ticket, and receipt. Where multiple personnel are required to manage different tasks.</p> <p><b>Current State Value Stream Mapping (VSM):</b> Pre-CRS 1.0: Consist of 18 processes, with a processing time of 310mins &amp; waiting time of 11985mins, and process efficiency of 2.25%, Non-Value-Added: Total Non-Value Added of 39, which includes motion, waiting, extra processing, overproduction &amp; non-utilized talent, Value-Added: registration input, invitation letter, receipt, on-day registration with certificate. Post-CRS 1.0: Consists of only 6 processes, with process time of 42.3 minutes, waiting time of 21 minutes, and process efficiency of 66.75%.</p> <p><b>Kaizen Burst &amp; Root Cause Analysis:</b> Implement 7 in 1 module within CRS 1.0 (Registration, E-Invitation Letter, E-Receipts, Analytics, Accounting, On-Day Registration system &amp; E-Feedback with E-Certs). When using automation modules, 1 single data from a participant is used from the beginning till the end, moderated by only 1 CRS 1.0 manager with no extra burden. Ishikawa Diagram identified issues where multiple personnel used to manoeuvre this registration system, extra processing of forms, delay in receiving invitation letters, postage costs, analysis resulting in errors or mismatch calculation, and overproduction of papers.</p> <p><b>Countermeasures &amp; Action Plan:</b> All 7 modules were included in the CRS 1.0 Google with autocrats, linked with the registration Google form &amp; feedback Google form, For registration, once payment is validated, participants will receive the E-ticket, E-receipt and e-letter immediately, the same data will be used on Course Day registration using QR code</p>

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scanner for fast registration, finally once E-feedback form is submitted, the participants will receive the E-Certs immediately.

**Sustainability:** Successfully used & launched in a total of 6 courses (50 participants/course) & 3 conferences (involving 200-500 participants). The system can be easily replicated to MOH facilities with a secure domain with extra features by using MyGovUC 2.0 account.

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## 1.0 Introduction

The orchestration of events, whether academic, social, or professional, hinges upon the meticulous and efficient management of registrations. This process, although fundamentally vital, frequently grapples with an array of challenges when executed through conventional event registration systems. These limitations give rise to a host of issues, encompassing user frustrations, operational inefficiencies, and impediments to the seamless progress of registrations. The resultant delays in the issuance of responses, invitations, tickets, and receipts only compound these issues, often necessitating the involvement of a cadre of personnel to oversee and manage disparate tasks within the registration workflow.

In the landscape of event management, the traditional registration systems in place demand a comprehensive examination of their constraints, and the concurrent exploration of innovative strategies for enhancement. This thesis endeavors to embark on this exploratory journey, shedding light on the multifaceted realm of event registration systems. Our aim is to meticulously scrutinize the inadequacies inherent in these systems, and in turn, propose forward-thinking solutions that can ameliorate the challenges faced by event organizers and attendees alike.

This research aspires to chart a course toward an evolved event registration system, one that not only optimizes user experiences but also streamlines administrative operations. In doing so, we seek to expedite the issuance of responses and vital documents such as invitations, tickets, and receipts, ultimately lessening the reliance on multiple personnel for the management of diverse registration tasks.

Our investigation will traverse the intricate landscape of event registration systems, dissecting their limitations, and envisioning a transformative paradigm that harmonizes with the evolving requirements of contemporary event management. Through a meticulous examination of contemporary technologies, administrative paradigms, and user expectations, we endeavor to set the stage for a more sophisticated, responsive, and seamlessly integrated event registration system. In doing so, we aim to redefine the very essence of event management by mitigating the challenges inherent in traditional registration systems and paving the way for a more efficient and user-centric approach.

## 2.0 Research Methodology

The research employ a mixed-methods approach, incorporating both quantitative and qualitative methods to comprehensively evaluate the Course Registration System. This approach allows for a holistic understanding of the system's effectiveness and user satisfaction. Online Surveys was conducted among event organisers and participants to gather data on system usability , efficiency and user satisfaction during the Digital Transformation Approach In Emergency Department Course on 28<sup>th</sup> February 2023. Usage data also was

collected for 5 events on number of registrations, user demographics, to analyze system performance and user behaviour.

In-depth interviews was done with a selected group of event organizers and participants to gain insights into their experiences and perceptions regarding the system. Open-ended questions was used to explore user opinions, challenges, weaness and suggestions for improvement. A purposive sampling approach was used to select event organizers with varying levels of experience and event sizes to ensure a representative sample. While for participants were recruited through convenience sampling, targeting individuals who have registered for digital events using the system. Descriptive statistics, including means, standard deviations, and percentages, will be used to summarize survey responses and usage data. On top of that VSM analysis will be done for Pre-CRS and Post-CRS using eVSM, to look at the total process, total waiting time, total lead time, wastes and process efficiency. Informed consent was obtained from all participants involved in interviews and surveys. Participant anonymity and confidentiality will be maintained throughout the research process. Limitations of this study may include potential respondent bias and the generalizability of findings, as data will be collected from a specific set of event organizers and participants.

The research methodology outlined above will provide a comprehensive assessment of the Course Registration System, offering valuable insights into its usability, user satisfaction, and areas for improvement. The combination of quantitative and qualitative methods will enhance the validity of the study's findings.

### 3.0 Result and Discussion

Online survey with 27 participants on using likert scale on 8 paramaters of Course Registration System. Lowest Score of 1, Highest Score of 6 within the scale per question, Maximum score of 162 per parameters.

**Table 1**

CRS features	Total Score	Percentage	Mean	Median	Standard Deviation
Dashboard	151	93.20%	5.59	6	0.57
E-Receipt & E-Ticket	152	93.83%	5.63	6	0.56
E-Invitation Letter	152	93.83%	5.63	6	0.56
Analytics	155	95.68%	5.74	6	0.45
Food & Allergy Dashboard	149	91.97%	5.52	6	0.7
Registration Day Dashboard	151	93.20%	5.59	6	0.5
E-Certificate with E-Feedback	153	94.44%	5.67	6	0.55
Overall Satisfactory	155	95.68%	5.74	6	0.53

The Dashboard feature received a total score of 151, equivalent to 93.20% of the maximum score. This indicates a high level of satisfaction among users. The mean satisfaction rating for the Dashboard feature is 5.59, with a median score of 6 and a relatively low standard deviation of 0.57. These statistics suggest a consistent and positive user experience. E-Receipt & E-Ticket feature scored 152 points, representing 93.83% of the maximum score, indicating a high

level of user satisfaction. The mean score of 5.63 and the median score of 6 suggest that the majority of users found this feature highly satisfactory. The low standard deviation of 0.56 indicates minimal variation in user opinions.

The E-Invitation Letter feature also scored 152 points, with a satisfaction percentage of 93.83%. This feature is well-received by users. With a mean score of 5.63, a median score of 6, and a standard deviation of 0.56, it is evident that users consistently find this feature to be highly satisfactory. The Analytics feature achieved a total score of 155, accounting for 95.68% of the maximum score, indicating a very high level of satisfaction. Users, on average, rated this feature at 5.74, with a median score of 6 and a low standard deviation of 0.45, suggesting a strong consensus among users regarding its effectiveness. The Food & Allergy Dashboard feature received a total score of 149, equivalent to 91.97% of the maximum score, indicating a generally high level of satisfaction. The mean satisfaction rating for this feature is 5.52, with a median score of 6 and a higher standard deviation of 0.70. While the majority of users are satisfied, there is slightly more variability in user opinions compared to other features. The Registration Day Dashboard feature achieved a total score of 151, representing 93.20% satisfaction among users. With a mean satisfaction rating of 5.59, a median score of 6, and a standard deviation of 0.50, users consistently find this feature to be highly satisfactory.

The E-Certificate with E-Feedback feature received a total score of 153, equivalent to 94.44% of the maximum score, indicating a high level of satisfaction. The mean satisfaction rating of 5.67, a median score of 6, and a standard deviation of 0.55 suggest consistent user satisfaction with this feature. In summary, the overall satisfaction score for the entire system is 95.68%, reflecting a very high level of user satisfaction. The mean score of 5.74, a median score of 6, and a standard deviation of 0.53 demonstrate a strong consensus among users regarding the system's effectiveness and usability.

The results indicate that the Course Registration System has been well-received by users across various features. Overall, the system achieved an exceptionally high satisfaction rate of 95.68%, reflecting its effectiveness and user-friendliness. Users consistently rated most features with mean scores close to 6, suggesting that the system meets or exceeds their expectations.

While the Food & Allergy Dashboard feature had a slightly higher standard deviation, indicating some variability in user opinions, it still received a satisfactory rating of 91.97%. This suggests that most users find it useful, although there may be room for improvement in addressing the needs of a more diverse user base.

In conclusion, the high satisfaction scores across all features of the Course Registration System indicate its success in meeting user expectations. These findings provide valuable insights into the system's strengths and areas where further enhancements may be considered to maintain and even improve user satisfaction in the future.

Table 2

METRIC	PRE	POST
TOTAL PROCESS	18	6
TOTAL WAITING TIME (MINS)	11985	21
TOTAL PROCESSING TIME (MINS)	310	42.3
LEAD TIME (MINS)	12295	63.3
PROCESS EFFICIENCY	2.25%	66.75%
NON VALUE ADDED TOTAL	39	0

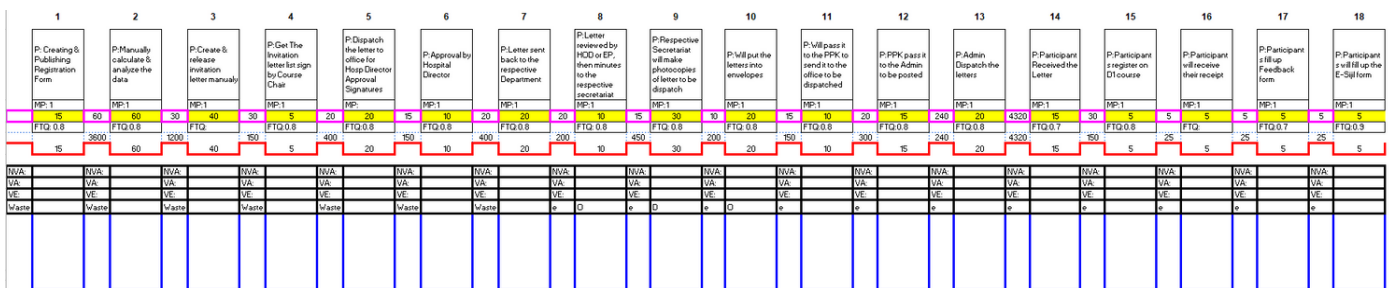


Figure 1 : VSM pre CRS

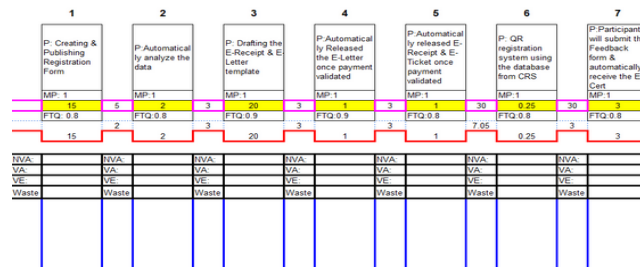


Figure 2 : VSM post CRS

The table 2 inclusive of VSM Pre CRS (Image 1) an VSM post CRS (Image 2) provides a comparison of key metrics before and after the implementation of the Course Registration System. These metrics offer valuable insights into the system's impact on process efficiency, waiting times, processing times, and the elimination of non-value-added activities. Before the system implementation (PRE), there were 18 total processes involved in event registration. However, post-implementation (POST), this number significantly reduced to 6. This indicates a streamlining of the registration process, reducing complexity and potentially minimizing user burden. Prior to the system implementation, the total waiting time for event registration was a staggering 11,985 minutes. After the system was put in place, this waiting time drastically decreased to just 21 minutes. This substantial reduction in waiting time suggests a significant improvement in user experience and efficiency. In the pre-implementation phase, the total processing time for event registration was 310 minutes. Post-implementation, this processing

time was reduced to 42.3 minutes. This signifies a remarkable enhancement in the speed of processing registrations. The lead time, which accounts for both waiting and processing times, demonstrates a substantial reduction from 12,295 minutes before the system to just 63.3 minutes after its implementation. This reflects a tremendous improvement in the overall time required for event registration. Process efficiency before system implementation was a mere 2.25%, indicating significant inefficiencies, delays, and waste in the registration process. However, post-implementation, process efficiency skyrocketed to 66.75%, illustrating the system's ability to eliminate bottlenecks and streamline operations. In the pre-implementation phase, there were 39 instances of non-value-added activities within the registration process. Remarkably, after system implementation, this number reduced to zero, signifying the successful elimination of wasteful processes.

The results of the comparison between the pre- and post-implementation phases of the Course Registration System are striking and demonstrate the system's profound positive impact on the efficiency and effectiveness of event registration processes.

First and foremost, the reduction in the total number of processes from 18 to 6 signifies a simplification of the registration procedure, potentially making it more user-friendly and less prone to errors. The most significant improvement is evident in the substantial reduction of waiting time, from 11,985 minutes to a mere 21 minutes. This suggests that the Course Registration System has effectively minimized delays, enhancing the user experience and potentially increasing user satisfaction. Furthermore, the reduction in processing time from 310 minutes to 42.3 minutes highlights the system's efficiency in handling registrations more swiftly and accurately.

The dramatic decrease in lead time, from 12,295 minutes to 63.3 minutes, underlines the system's overall effectiveness in reducing the time required for event registration, thus improving the efficiency of the entire process. The most compelling metric is the increase in process efficiency, from a meager 2.25% to a remarkable 66.75%. This indicates that the Course Registration System has succeeded in eliminating bottlenecks, redundancies, and non-value-added activities, resulting in a highly efficient registration process. Lastly, the elimination of non-value-added activities entirely post-implementation indicates that the system has effectively identified and eradicated wasteful processes, further enhancing process efficiency. In conclusion, the Course Registration System has proven to be a transformative tool in optimizing event registration processes. The substantial reductions in waiting time, processing time, lead time, and the complete elimination of non-value-added activities demonstrate its significant positive impact. These improvements ultimately contribute to a more efficient, user-friendly, and effective event registration system.

The image shows a registration form with the following fields:

- Email Address \*
- Your answer
- Contact Number \*
- With country code, e.g. +6
- Your answer

Figure 3:Registration E-form

The image shows a spreadsheet with the following columns:

- ID
- Name
- Email Address
- Registration Number
- Registration Date
- Registration Time
- Registration Status
- Registration Category
- Registration Fee
- Registration Payment

Figure 4: Registration Raw data







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