Electronic Document and Records Management System (EDRMS) Adoption in Public Sector – Instrument’s Content Validation Using Content Validation Ratio (CVR)

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Abstract. Although Electronic document and record management system (EDRMS) is perceived to benefit the management of records and document in organizations, the system is not fully utilized due to consumers resistance, particularly in public sectors. The adoption of this system is influenced by ten identified factors and thus becomes the basis for the development of the instruments (questionnaire). This study aims to validate the content of the instrument by complying rigorous protocol. Content Validity Ratio (CVR), which is a quantitative approach is adapted to validate the contents of the questionnaire. The content validation process involves eleven selected experts based on their related experience and expertise. 7 from 78 indicators were rejected after the content validation was performed. Only 71 indicators were accepted for the final questionnaire. These validated final instruments can be used to assess the EDRMS adoption in the public sector organization.

1. Introduction
The electronic document management and record management system (EDRMS) is able to bid on an effective solution in the form of document management and record management in the public sector [1]. As an application system, EDRMS supports the creation, use, and maintenance of documents and records manually and electronically to produce efficient and systematic workflows [2]. This system provides the organizational advantage by providing accurate, fast and accessible information, thereby reducing operating costs [3]. In addition, EDRMS provides good security functions in government records processing procedures [4] thus enhancing the transparency and accountability of the organization [5] in producing a dynamic information management system [6]. The use of EDRMS has proven to allow several countries such as Croatia, Germany, and Australia to enhance the efficiency of document management and records in their respective organizations [7]. There were a number of information and communication technology (ICT) projects implemented by public organizations experienced failure [8] due to low adoption rates among consumers. Factors affecting the adoption of EDRMS involve two levels which are organizational and individual. However, only a few studies have investigated the individual level. Majority of the research was focused on adopting EDRMS at the organizational level as revealed by the study conducted by [9] and [10]. [11] also suggested that factors affecting EDRMS adoption amongst users in the public sector should be identified to reduce the problem of low consumption levels. Therefore, this study focuses on the adoption of EDRMS at the individual level by involving two technology adoption theories: Unified Theory of Acceptance and Use of Technology (UTAUT) and Information System Success Model (ISSM).

1.1 Instrument Development
The questionnaire is an effective data collection instrument for researchers to know how the constructs are measured [12]. The data collected are up-to-date, uniform, flexible and involve large samples [13].

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The questionnaire development process involves the implementation of a comprehensive literature review to understand the concept of the study and to identify: i) related adoption theories ii) factors that influence the EDRMS adoption in public sector and iii) indicators to measure each of identified factors. The results have contributed to the identification of ten (10) factors as illustrated in Table 1.

| No. | Construct                         | Operational Definition                                                                 | Source(s)       |
|-----|-----------------------------------|----------------------------------------------------------------------------------------|-----------------|
| 1   | Performance Expectancy            | Involves the situation in which system’s users believe that EDRMS is able to improve their job performance | UTAUT [11], [14], [15] |
| 2   | Effort Expectancy                 | Involves the situation in which system’s users believe that EDRMS is easy to use       | UTAUT [11], [14]–[16] |
| 3   | Social Influence                  | Individuals can be influenced by the attitudes and behaviors of other individuals and vice versa | UTAUT [11], [14], [15] |
| 4   | Facilitating Conditions           | The role of organizational and technical infrastructure in support of the use of EDRMS (training) | UTAUT [11], [14], [15] |
| 5   | System Quality                    | Quality features that should be available on EDRMS (easy to use, user-friendly and good response time) | ISSM [17]       |
| 6   | Information Quality               | The capability of EDRMS to provide accurate, up-to-date, adequate, and relevant information | ISSM [18], [19] |
| 7   | Service Quality                   | The assistance and support from the EDRMS implementation team and the organization’s ICT support team | ISSM [17], [18] |
| 8   | Perceived Value of Records        | The system’s users believe that knowledge artifacts (e.g., written documents, letters, emails, etc.) are valuable and are worthy to be stored | [20]            |
| 9   | Policy                            | The system’s users believe that policy can provide a way of action to guide and determine current and future decisions | [21], [22]     |
| 10  | Security                          | The system’s users believe that the use of technology can ensure the safety of documents and records | [20], [21]     |

1.2 Content Validity
The instrument development needs to go through the content validity process to ensure that identified construct are legitimate, clear and reflect its contents [22], [23]. Content validity is a category of construct validity. It is the degree to which the elements of an assessment instrument are relevant to and representative of the targeted construct for a particular assessment purpose [24]. The content validity can be implemented qualitatively or quantitatively as mention in Table 2.

| Method                        | Description                                                                                                                                 |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Qualitative                   | 1. Intensive Literature Review [23], [24] The construct is measured by adapting questions from previous researchers. This method only refers to existing instruments, without going through an evaluation process by a panel of experts. Constructs are measured on the basis of evaluation analysis through comments, ideas, and feedback from the experts. |
|                               | 2. Content Validation by Panel of Experts [24], [25] This method involves the assessment of constructs by a group of experts using a scale of three or five to assess each construct. Experts can also provide their additional views. The number of experts is not determined and usually depends on the suitability of the study. The CVR calculation is based on the acceptance criteria set by Lawshe (1975). |
| Quantitative                  | 1. Content Validation Ratio (CVR) [26], [27] This method involves the assessment of constructs by a group of experts using a scale of three or five to assess each construct. Experts can also provide their additional views. The number of experts is not determined and usually depends on the suitability of the study. The CVR calculation is based on the acceptance criteria set by Lawshe (1975). |
Content validity is also known as expert confirmation as it is performed by a group of professional panels or experts in the related field [12]. Recent studies on EDRMS adoption mostly use qualitative methods for content validity processes such as studies conducted by [17], [11]and [20]. According to [24], qualitative analysis is difficult to interpret and the results obtained are less accurate because the questionnaire usually involves a large number of items. Accordingly, [26] also believes the quantitative analysis is a better solution for content validity. Quantitative methods using Lawshe techniques are selected for this study because of its practicality. Based on a study conducted by [29], the CVR calculated using Lawshe techniques is more practical, easy and saves time, especially during the evaluation process. CVR uses binomial distribution and also prepares tables to determine the values to be followed in calculations based on the number of experts involved [26]. In addition, CVR calculations are also suitable for studies involving a small number of experts. Accordingly, this study uses the CVR method for content validity as well as being used in the study of [26]; and [24].

2. Research Method
The content validity processes in this study consist of two steps ie: i) content validation by the panel of experts and ii) feedback analysis using CVR.

2.1 Content Validation by Panel of Experts
As recommended by [24], the selected panel of experts should be involved and experienced in the related domain and have expertise in the instrument development. A total of eleven (11) experts were involved in the interview. The selected panel of experts consists of academicians, practitioner, and professionals. Selection criteria are based on their experiences and involvement in relevant areas for at least 10 years, knowledgeable and experienced in electronic document and records management; experienced in EDRMS implementation in the Public Sector; and knowledgeable in theory, statistical or constructive measurement. Each expert takes between 40 minutes to 1 hour to complete the content validity session. The experts were also asked to evaluate and validate the significance of the indicator based on a 5-point Likert scale which is “1-very disagree”, “2-disagree”, “3-agree” (but not important), “4-agree” and “5-strongly agree”. Experts were also invited to offer their opinion or comments in the space provided.

2.2 Feedback Analysis using CVR
Experts feedback is statistically analyzed using Microsoft Excel software. The consensus among panel experts is measured by the calculation of CVR [27]. In calculations, the answers "4" and "5" are considered relevant while the answers "1", "2" and "3" are irrelevant. The formula used to calculate the CVR as proposed by [27] is \[ CVR\ Value = (2Ne / N) - 1 \]. In the formula, “Ne” represents the number of experts who gave the relevant answer "4-Agree" and "5-Strongly Agree" while “N” is the total number of experts. This equation is described in table 5.

| Description | Equation |
|-------------|----------------|
| The CVR value is 1.00 (all agree) | If all the experts answered "4" and "5" |
| The CVR value is positive (ranging from 0.00 to 0.99) | If more than half (>50%), but less than all (<100%) experts answered "4" or "5" |
| The CVR value is negative | If less than half (<50%) of the experts answered "4" or "5" |

Acceptance criteria for each indicator (minimum CVR value) depend on the total number of the panel experts. The CVR minimum value is set at a probability of five percent (p=0.05) and compared to the number of experts participating in the study [27]. Given the number of experts involved is 11, the
minimum CVR received is 0.59 (refer to the minimum value of CVR table by [27]). This means that each indicator with a value of 0.59 and above (>=0.59) is accepted and included in the final questionnaire while indicators with values of 0.58 (<=0.58) and below are rejected and removed from the final questionnaire.

3. Results and Discussion
Table 4 shows the final results of CVR calculations. Based on the calculations, there are 7 indicators rejected for a value of 0.58 and below. Only 71 indicators were accepted for the final questionnaire. The constructs and accepted indicators are then arranged according to the format specified. This instrument is considered as a reliable tool to assess the EDRMS adoption by the system’s user.

| Construct          | Indicator                                                                 | Ne | CVR     | Results |
|--------------------|---------------------------------------------------------------------------|----|---------|---------|
| Performance        |                                                                            |    |         |         |
| Expectancy (PE)    |                                                                            |    |         |         |
| PE1                | EDRMS allows me to complete routine tasks more easily                      | 11 | 1       | Accepted|
| PE2                | EDRMS allows me to complete routine tasks faster                           | 11 | 1       | Accepted|
| PE3                | EDRMS can improve my work performance                                      | 11 | 1       | Accepted|
| PE4                | EDRMS helps provide higher promotion opportunities                          | 11 | 1       | Accepted|
| PE5                | EDRMS manages record security well                                         | 6  | 0.09    | Rejected|
| PE6                | EDRMS provides reliable information                                        | 10 | 0.82    | Accepted|
| PE7                | EDRMS is able to support my job requirements                               | 11 | 1       | Accepted|
| PE8                | I find that the classification of records within EDRMS is intuitively     | 6  | 0.09    | Rejected|
| Effort             |                                                                            |    |         |         |
| Expectancy (EE)    |                                                                            |    |         |         |
| EE1                | EDRMS provides a user-friendly system interface                            | 11 | 1       | Accepted|
| EE2                | EDRMS is easy to learn                                                     | 10 | 0.82    | Accepted|
| EE3                | EDRMS is easy to use in daily work                                        | 11 | 1       | Accepted|
| EE4                | EDRMS is easy to control                                                   | 11 | 1       | Accepted|
| EE5                | I frequently use EDRMS to sharpen my skills                               | 11 | 1       | Accepted|
| EE6                | I can learn to manage the task of using EDRMS without problems            | 11 | 1       | Accepted|
| EE7                | I find that the records in the system are well organized                   | 10 | 0.82    | Accepted|
| EE8                | The process of adding records into EDRMS is simple                         | 11 | 1       | Accepted|
| EE9                | I have no problem achieving the record using EDRMS                        | 11 | 1       | Accepted|
| EE10               | Overall I found EDRMS easy to use                                         | 8  | 0.45    | Rejected|
| Social             |                                                                            |    |         |         |
| Influence (SI)     |                                                                            |    |         |         |
| SI1                | My colleague thinks I should use EDRMS                                   | 11 | 1       | Accepted|
| SI2                | My subordinates think I should use EDRMS                                  | 11 | 1       | Accepted|
| SI3                | My top officials think I need to use EDRMS                                | 11 | 1       | Accepted|
| SI4                | The use of EDRMS is supported by the organization                         | 11 | 1       | Accepted|
| SI5                | I use EDRMS because my subordinates use it as well                        | 11 | 1       | Accepted|
| SI6                | Individuals that use EDRMS are more reliable than those who do not use it | 11 | 1       | Accepted|
| SI7                | Individuals who use EDRMS are more highly regarded                        | 11 | 1       | Accepted|
| SI8                | My chance of getting recognition is higher by using EDRMS                 | 11 | 1       | Accepted|
| SI9                | EDRMS affects my reputation                                               | 11 | 1       | Accepted|
| Facilitating       |                                                                            |    |         |         |
| Condition (FC)     |                                                                            |    |         |         |
| FC1                | The organization provides adequate infrastructure                         | 11 | 1       | Accepted|
| FC2                | The organization provide training sessions                                | 11 | 1       | Accepted|
| FC3                | Support teams are available to assist if there is difficulty in managing EDRMS | 11 | 1       | Accepted|
| FC4                | EDRMS can be used with other technologies (eg: Microsoft word, email)     | 10 | 0.82    | Accepted|
| FC5                | The top management gave good support to the EDRMS initiative               | 11 | 1       | Accepted|
| Construct          | Indicator                                           | Ne | CVR | Results   |
|-------------------|-----------------------------------------------------|----|-----|-----------|
| System Quality (SQ)| SQ1 Executed without interruption                   | 10 | 0.82| Accepted  |
|                   | SQ2 Operating smoothly                               | 11 | 1   | Accepted  |
|                   | SQ3 Always ready to use at all times                 | 11 | 1   | Accepted  |
|                   | SQ4 Always ready to be used by all agencies in the public sector. | 8  | 0.45| Rejected  |
|                   | SQ5 Always ready to provide information, reports, and services | 11 | 1   | Accepted  |
| Information Quality (IQ) | IQ1 Right (free from mistakes)                      | 11 | 1   | Accepted  |
|                   | IQ2 Valid (adhered to the purpose)                   | 11 | 1   | Accepted  |
|                   | IQ3 Reliable (complete)                              | 11 | 1   | Accepted  |
|                   | IQ4 Accountability (adequate and accurate)           | 11 | 1   | Accepted  |
|                   | IQ5 Whole (complete and unchanged)                   | 11 | 1   | Accepted  |
|                   | IQ6 Usability (can be traced, retrieved, used and interpreted) | 11 | 1   | Accepted  |
|                   | IQ7 Latest (always updated)                          | 11 | 1   | Accepted  |
| Service Quality (SV) | SV1 Timely service                                   | 11 | 1   | Accepted  |
|                   | SV2 Reliable service                                 | 11 | 1   | Accepted  |
|                   | SV3 Correct service                                  | 7  | 0.27| Rejected  |
|                   | SV4 The right service                                | 9  | 0.64| Accepted  |
|                   | SV5 Perfect service                                  | 11 | 1   | Accepted  |
|                   | SV6 Services that are constantly monitored for its effectiveness | 11 | 1   | Accepted  |
| Perceive Value of Records (PVR) | NR1 Record management is the responsibility of all employees in the organization | 11 | 1 | Accepted |
|                   | NR2 Records management is a necessity in working efficiency | 11 | 1 | Accepted |
|                   | NR3 Record management is an important part of my daily tasks | 11 | 1 | Accepted |
|                   | NR4 I rely on the record to remind me of the details of the last job | 11 | 1 | Accepted |
|                   | NR5 I often refer to the record for the information required in my daily work | 11 | 1 | Accepted |
|                   | NR6 I keep records in EDRMS in the hope that the records can be referred to by other officers | 11 | 1 | Accepted |
|                   | NR7 I use the record as credible evidence            | 11 | 1   | Accepted  |
|                   | NR8 Organizations rely on records to achieve organizational goals | 11 | 1 | Accepted |
|                   | NR9 Well-managed records can increase accountability | 11 | 1 | Accepted |
| Policy (P)        | P1 To make sure the system complies with legal and regulatory requirements | 11 | 1 | Accepted |
|                   | P2 Easy to understand                                | 11 | 1   | Accepted  |
|                   | P3 Cover all system functions                        | 11 | 1   | Accepted  |
|                   | P4 Easy to implement                                 | 11 | 1   | Accepted  |
|                   | P5 Save costs                                        | 6  | 0.33| Rejected  |
|                   | P6 Enforced                                          | 11 | 1   | Accepted  |
|                   | P7 Coordinated (distributed) to all organizations involved | 9  | 0.64| Accepted  |
| Security (S)      | S1 Organizations protect the information assets properly | 11 | 1 | Accepted |
|                   | S2 I believe my organization is able to survive from disaster involving the loss of electronic documents and records | 11 | 1 | Accepted |
|                   | S3 I believe the electronic documents and records that I use are guaranteed to be safe as EDRMS provides control at all levels (individuals, working groups, and organizations) | 11 | 1 | Accepted |
|                   | S4 I feel my work environment is safe                | 11 | 1   | Accepted  |
| Intention to Adopt EDRMS (IAE) | IAE1 I will use EDRMS regularly | 11 | 1 | Accepted |
|                   | IAE2 I will use EDRMS as part of my daily tasks      | 11 | 1   | Accepted  |
|                   | IAE3 I will often contribute (capture) records into EDRMS | 11 | 1 | Accepted |
|                   | IAE4 I will give a high commitment to adopt EDRMS    | 11 | 1   | Accepted  |
|                   | IAE5 I expect to use EDRMS regularly within the next 6 months | 7  | 0.27| Rejected  |
|                   | IAE6 My expectation of adopting EDRMS is high        | 11 | 1   | Accepted  |
4. Conclusion
Content validity is a crucial process in instrument development to ensure the quality and effectiveness of the resulting instrument. The CVR method used in this study shows the clear steps and accurate calculation formula making it's easy to implement. After performing the content validation process, this instrument can be used as a valid (reliable) tool to measure the level of EDRMS adoption among users in the public sector. Final CVR results indicate that 71 out of 78 indicators were accepted while 7 were rejected. The research results also provide new opportunities for practitioners, who can use the measurement instrument to assess the EDRMS adoption in their organization.

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