

# Kg Id Card Printing Administration System: Study From Real Industry

Johanes Hauwin, Seng Hansun

**Abstract:** Technology era has greatly improved that can lead to a change from a system to another system that enabled for less dependency over certain things. In Kompas Gramedia inventory, billing, and request of idcard that have many purposes still depended on paper base system which many people think too slow, not efficient, and need a lot of effort. Because of that a web-based idcard printing administration system has been created to improve and digitalized the system. The created system can manage an invoice or billing more efficient and paperless. It can manage, make, and save invoice data better than its old predecessor. It can manage all items that needed for idcard printing which has a reminder function when a certain item has reached its stock limit and function to tell people how far their request progress to make a new idcard. The system was made using PHP language with CodeIgniter 3.1.9 as its framework, PHPMailer as its library, and DataTables and SweetAlert2 as its plug-in. The system has been tested using UTAUT and Likert scale with Performance Expectancy result is 78.66%, Effort Expectancy result is 66.66%, Facilitating Conditions result is 74.44%, Attitude Toward Using Technology result is 76.66%, Anxiety result is 46.66%, and Behavioral Intention result is 70%. The system has been tested and ready to be implemented in Kompas Gramedia.

**Index Terms:** idcard, digitalization, request, inventory, Billing, KG.

## 1. INTRODUCTION

KOMPAS Gramedia is a company which has many employees who need identity. Idcard became solution and easy way for the company to give an identity, tracking attendance, giving an access to certain individual, and became a mean of advertisement. Sadly, idcard system before this system was developed still relied on paper documentation [1]. According to Ray Morgan there are nine advantages gained when applied paperless concept in a company [2]. The advantages are reduced place needed for storage, safe from natural disaster, editing became easy, preventing from data lost, preventing data leak, easy to access, easy to find, easy to distribute, and reducing cost to make those document[2]. Because there was no administration system that managed, processed, and saved idcard printing data, then many problems appear. The invoice billing for idcard printing was still needed to be printed physically and sent it to all side in many difference locations which caused a slow billing process. The process to manage materials used to print idcard still relied on inventory ledger book which caused no data transparency, and the process to request the printing idcard still relied on paper which make it difficult to know which step that was requested[1]. To get a better understanding, some basic concepts and the company background will be described in the next section. The system design and methods will be given in Section 3 and continued with the results and discussion in Section 4. Lastly, a conclusion remark will be deducted from the evaluation result and ended the organization of this paper.

## 2 BASIC CONCEPTS

In this section, some basic concepts and background will be described here, i.e. Kompas Gramedia, id card, inventory, request, and billing system, HR Portal, and Unified Theory of Acceptance and Use of Technology (UTAUT) evaluation model.

### 2.1 Kompas Gramedia

Kompas Gramedia (KG) history begin from the publishing of Intisari Magazine by Petrus Kanisius Ojong and Jakob Oetama as an answer to public demand to a quality reading material[3]. After in business more than 56 years, Kompas Gramedia has managed many sections, like mass media, resort, education, infrastructure & property, retail & publishing, printing, event & venue, education, and many more business sections in Indonesia[4]. Total employees in Kompas Gramedia almost reached 23 thousand people in all over Indonesia from the last recorded data on January 2017[5]. With new system comes new rules in company, like in creating an invoice in billing section there will be two types of user, i.e. the invoice maker and the invoice receiver. The invoice maker is a user who has access to make and send invoice of idcard printing. The invoice receiver is Employee who has position as a HR Unit which has requested idcard printing for their employee in their unit and has to give approval of that invoice. In inventory section also has two types of user, i.e. inventory which manage materials for idcard printing and stock who can only see quantity of materials for idcard printing. In request section, every employee can use the request idcard feature and the track idcard feature.

### 2.2 ID Card, Inventory, Request, and Billing

Idcard (identity card) used to identify certain aspect from person such as name, age, address, identity number, or other else[6]. Idcard is an example of applied smart card technology which have memory chip or microprocessor embedded inside and if paired with appropriate reading device can create processing power for many purposes like controlling access data[7]. According to [8], idcard has two types of memory which act like USB stick with higher security or microprocessor which can add, delete or manipulate data inside. Ref. [8] also stated that idcard can be separated to two types according to its way to interact. Contact that need physical contact in order to function or contactless that doesn't need physical contact because antenna placed inside its body. Idcard in KG is belong to memory and contactless type which have division's logo, name, photo, and employee's number printed on a custommade idcard for Kompas Gramedia. Inventory management is an important factor in production and distribution process so it must be done effectively in order to

- *Johanes Hauwin is a graduate student from the Informatics department in Universitas Multimedia Nusantara, Indonesia, 15131. E-mail: johanes.hauwin@student.umn.ac.id*
- *Seng Hansun is currently a lecturer in Informatics department in Universitas Multimedia Nusantara, Indonesia, 15131. E-mail: hansun@umn.ac.id*

reduce the production cost[9]. It's also need to get the data in the procurement system, such as supplier code, the method of payment, order quantity, etc. [10]. Before the system built, data materials for idcard printing was recorded inside an inventory ledger book[1]. The new inventory system will record all materials for printing idcard data in certain storage location and processing that data so it will be useful for its user. It will show how much the materials are left and when its quantity increase. The company rule before this system was developed is if an employee wants to request an idcard, he or she must submit a document that stated his or her reason for request and must pay a price for idcard that decided in rule to her or his HR Unit section. The requested reason come in four categories, i.e. losing his or her idcard, his or her idcard is broken, he or she has a change position or division, or he or she became a new employee in the company. The person in his or her HR Unit will make request using a system that called 'idcard online'. The new system will follow that rule in additions his or her request can be tracked online for transparency. In the previous system the invoice was made manually by typing in excel, print it, then send it by courier or other mean to HR unit that deserve it. In the developed system if a HR unit requested idcard that HR unit will receive an invoice in system by admin center who printed the idcard after a certain period. The invoice will be accompanied by details of request such as date request, type request, and other details. It is important to have a fast invoice and the offers of providing the correct invoice data [11] so HR unit must give an approval or complaint about that invoice. Fail to do so in seven days after it was sent will automatically approve that invoice. If complain was given then the complaint will be notified to the sender and will make a new invoice. If approval was given then system will offer to make invoice document to be printed or saved by downloading the document. The invoice document can also be printed or saved in history section for sender or receiver invoice. The only difference is the sender can view the other HR units' invoice while receiver can't.

### 2.3 HR Portal

HR (Human Resources) Portal is an internal website of Kompas Gramedia that provide online media communication in HR section between company and employee which maintained by Corporate Human Resources – Human Resources Information System (CHR-HRIS) of Kompas Gramedia[12]. In line with the purpose of HR Portal as online media communication, there will be parts of system that developed located in HR Portal because it is more appropriate than placed all the system in idcard online. One example is the response of invoice will be accessible for employee in HR unit that has access and his or her invoice.

### 2.4 Unified Theory of Acceptance and Use of Technology

Unified Theory of Acceptance and Use of Technology (UTAUT) is a model of Technology Acceptance Model (TAM) that explained how some users of technology accept and use a certain technology[13]. UTAUT consist of four variables or factors to determine the relation between Behavioral Intention and User Behavior [14].

#### 1. Performance Expectancy

This factor is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance. The five constructs that define this

factor are Perceived Usefulness (PU), the degree to which a person believes that using a particular system would enhance his or her performance; Extrinsic Motivation (EM), the perception that users will want to perform an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions; Job Fit (JF), how the capabilities of a system enhance an individual's job performance; Relative Advantage (RA), the degree to which using an innovation is perceived as being better than using its precursor, and Outcome Expectation (OE) that relate to consequences of the behavior.

#### 2. Effort Expectancy

This factor is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance. The degree of ease associated with the use of system. The three constructs that define this factor are Perceived Ease of Use (PEU), the degree to which a person believes that using a system would be free of effort; Complexity, the degree to which a system is perceived as relatively difficult to understand and use; and Ease of Use (EoU), the degree to which using an innovation is perceived as being difficult to use.

#### 3. Social Influence

This factor is defined as the degree to which an individual perceives that others believe he or she should use the new system. This factor is not use in this research because a decision of using the system is mandatory according to rule in Kompas Gramedia.

#### 4. Facilitating Condition

This factor is defined as the degree to which an individual believes that an organizational and technical infrastructure exist to support the use of the system. The three constructs that define this factor are Perceived Behavioral Control (PBC) that reflect perceptions of internal and external constrains on behavior and encompasses the self-efficacy, resource facilitating conditions, and technology facilitating conditions; Facilitating Conditions (FC), factors in the environment that observers agree make an act easy to do, including the provision of computer support; and Compatibility, the degree to which an innovation is perceived as being consistent with existing values, needs, and experiences of potential adopters. There are three more variables or factors that also been used for more accuracy, i.e. Anxiety, Attitude toward using Technology, and Behavioral Intention. Ref. [13] even stated that these factors do not have same level to the four factors above.

## 3 SYSTEM DESIGN AND METHOD

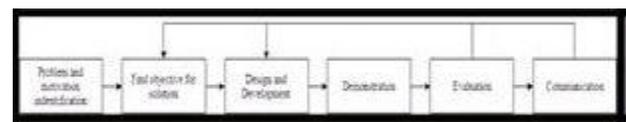


Fig. 1. Development method

The system design process was done according to the figure 1 that follows some steps[15]: 1. Problem and motivation identification. In this step, reason to solve the problems must be defined to motivate all stakeholders and to know how

deep the understanding of the problem that would be solved. The problem that was identified is a need of system that make billing process of idcard printing paperless, a dynamic management of materials for idcard printing, and more effective and faster way for employee to request an idcard. 2. Find objective for solution. In this step, we find objective for solution for all problems that were known from previous step and decided that solution is viable and realistic. That objective can be quantitative which mean that solution is better than the current solution or qualitative which mean that solution for a problem that never be solved before. In this research overall objective are design and development of an administration system of idcard printing that capable to solve idcard billing problem, managing materials for idcard printing, and to speed up the id card request process. 3. Design and Development. In this step a product was made that can be a model, method, or other prototype base. With this step, features that needed will be known and its structure for final product will be known too. 4. Demonstration. In this step features and design that was made in the previous step for solving the problems in first step will be demonstrated to all stakeholders. This demonstration will be in many forms like simulation, experiment or other activities. This demonstration also will show how to use the product. 5. Evaluation. In this step solution in step 4 will be compared to solution in step 2. The result of evaluation will be used to know how effective the system or product to resolve the problem that want to be solved and how much resources are needed for the system to run. Depending on the result, the step that will be taken next could be varies. Next step can be step 2 if there are difference in objective or can be step 3 if function or feature doesn't meet the required or desired result. If no problem has been found, the next step will be step 6 and that system or product will be the final product or system. Evaluation will be done using Likert scale with questions made from UTAUT model to measure acceptance of the system. Likert scale is a scale used to measure people attitudes, opinions, and perceptions of a phenomena [16]. It was chosen because qualitative data can be converted to quantitative data for analysis and foundation for future research. 6. Communication. In this step, the problems will be delivered and discussed, how important that problem, how unique, original, or good that solution to professional practitioners.

#### 4 RESULTS AND EVALUATION

Once the system design phase has completed, the implementation phase of the software development process can be started. Figure 2 to 9 are a number of examples of the implementation results done as the implementation of the requirement analysis and system design phase beforehand.



Fig. 2. Inventory Management page



Fig. 3. Idcard status page

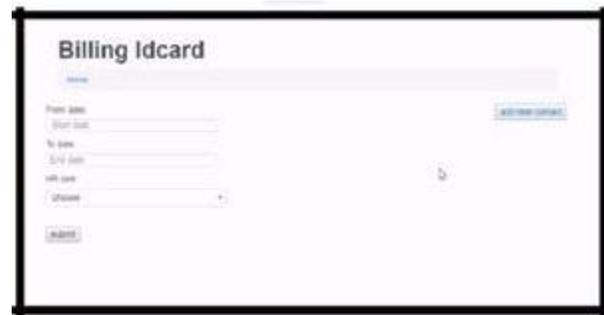


Fig. 4. Billing create invoice page



Fig. 5. Billing create invoice after input page



- [5] A. Prasandi, "CEO Kompas Gramedia: Bersama Kita Bisa Lebih Maju, Yakin Dapat Atasi Senjakala Koran,"[Online]. Available from <https://medan.tribunnews.com/2017/03/01/ceo-kompas-gramedia-bersama-kita-bisa-lebih-maju-yakin-dapat-atasi-senjakala-koran?page=3>
- [6] A.B. Hassan and Y.A. Fadlalla, "A Survey on Technique of Detecting Identity Documents Forgery,"Proc. of 2017SudanConference on Computer Science and InformationTechnology, Elnihood, Sudan, Nov. 2017.
- [7] L.A. Mohammed, A.R. Ramli, V. Prakash, and M.B. Daud, "Smart Card Technology: Past, Present, and Future,"International journal of the computer, the Internet and Management,vol.12, no.1, pp. 12-22, 2004.
- [8] Gemalto NV,"Smart Card Basic – A Short Guide,"[Online]. Available from <https://www.gemalto.com/companyinfo/smart-cards-basics>.
- [9] R. Chi and F. Tijun, "Decision Analysis to Solve Misplaced inventory with RFID,"Proc. of 2010International Conference onOptoelectronic and Image Processing,Haikou, China, pp. 360-370, 2010.
- [10] L. Jinping, "Under the IT Environment Inventory Accounting and Management Studies,"Proc. of 29<sup>th</sup> Chinese Controland Decision Conference (CCDC), Chongqing, China, pp.2579-2583, 2017.
- [11] Y-C. Chen, Y-T. Chang, Y-S. Kan, R.S. Chen, and S.F. Wu, "Using Data Mining Technique to Improve Billing System Performance in Semiconductor Industry,"Proc. of2018 International Conference on Information andComputer Technologies(ICICT), DeKalb, IL, USA, 2018.
- [12] Kompas Gramedia, "Terms,"[Online]. Available from <https://hr.kompasgramedia.com/term.php?id=2>
- [13] V. Venkatesh, M.G. Morris, G.B. Davis, and F.D. Davis,"User Acceptance of Information Technology: Toward A Unified View," MIS Quarterly, vol. 27,no. 3, pp. 425-478, 2003.
- [14] D. Kristiawan and Harisno,"Evaluation of Implementation MyUMN as Academic Information System Using UTAUT to Multimedia Nusantara University," Proc. of 2016 IEEE Region 10Symposium (TENSYP), Bali, Indonesia, pp.420-424, 2016.
- [15] K. Peffers, T. Tuunanen, M. Rothenberger, and S. Chatterjee,"A Design Science ResearchMethodology for Information System Research,"Journal ofManagement Information Systems, vol.24, no.3, pp. 45-77, 2007-2008.
- [16] I. Kurniati, S. Hansun, and F.P. Putri, "Employee Enrollment Decision Support System UsingAnalytical Hierarchy Process and Promethee Methods," ICSES Transactions on Data Science, Engineering and Technology, vol. 2, no. 1, pp. 1-8, 2019.