FINAL PROJECT – TI 141501

WORKLOAD AND JOB ANALYSIS FOR INCENTIVE SYSTEM DESIGN (CASE STUDY: RUMAH SAKIT PUPUK KALTIM)

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Surabaya 2016

TUGAS AKHIR – TI 141501

ANALISIS BEBAN KERJA DAN PEKERJAAN UNTUK MENDESAIN SISTEM INSENTIF (STUDI KASUS: RUMAH SAKIT PUPUK KALTIM)

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Surabaya 2016

VALIDATION SHEET

WORKLOAD AND JOB ANALYSIS FOR INCENTIVE SYSTEM DESIGN (CASE STUDY: RUMAH SAKIT PUPUK KALTIM)

UNDERGRADUATE THESIS

Submitted as one requirements
To acquire Undergraduate Degree Program
In Industrial Engineering Department
Faculty of Industrial Technology
Institut Teknologi Sepuluh Nopember

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SURABAYA, JULY 2016

WORKLOAD AND JOB ANALYSIS FOR INCENTIVE SYSTEM DESIGN (CASE STUDY: RUMAH SAKIT PUPUK KALTIM)

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ABSTRACT

Based on survey that already conducted by certain institution, more than 50% of worker in Indonesia were not satisfied with their current job due to several factors such as salary. Meanwhile high workload in Rumah Sakit Pupuk Kaltim caused several employees feel low motivation. However, current policy of Rumah Sakit Pupuk Kaltim decided to not recruit more employees. Job rotation also difficult to be implemented since each job in the hospital require specific skill for each unit. Thus, incentive system design was developed to appreciate employees' actual workload. Besides workload, incentive system design also considered the job analysis. Research was conducted in Medical Record unit, IGD unit, and Inpatient unit.

Objective assessment based on SNI 7269:2009 showed that workload in Medical Record unit was 289.96 kcal/hour (medium), in IGD unit was 143.65 kcal/hour (light), and in Inpatient unit was 119.18 kcal/hour (light). Meanwhile from subjective assessment using NASA-TLX, workload in Medical Record unit was 79.75 (high), in IGD unit was 82.01 (very high), and Inpatient unit was 78.40 (high). Job was assessed using Hay Job Evaluation and generated score of 295 for Medical Record unit and 394 for both IGD and Inpatient units. The incentive system design was developed by determining certain ratio for workload and job grading. By implementing this incentive system design, unit with lower grading score was able to receive more incentive if ratio for workload was high.

Keywords: Hay Job Evaluation, Incentive, NASA-TLX, SNI 7269:2009, Workload

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ANALISIS BEBAN KERJA DAN PEKERJAAN UNTUK MENDESAIN SISTEM INSENTIF (STUDI KASUS: RUMAH SAKIT PUPUK KALTIM)

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ABSTRAK

Berdasarkan survey yang telah dilakukan oleh instansi tertentu, lebih dari 50% pekerja di Indonesia merasa kurang puas dengan pekerjaannya disebabkan oleh beberapa faktor, salah satunya yakni gaji. Sementara itu, beban kerja tinggi di Rumah Sakit Pupuk Kaltim menyebabkan beberapa karyawan merasa kurang termotivasi. Akan tetapi, kebijakan Rumah Sakit Pupuk Kaltim saat ini memutuskan untuk tidak merekrut karyawan baru. Rotasi kerja juga sulit dilakukan karena tiap pekerjaan di rumah sakit membutuhkan keterampilan khusus di tiap unit. Sehingga desain sistem insentif dibangun untuk mengapresiasi beban kerja aktual dari karyawan. Selain beban kerja, desain sistem insentif juga mempertimbangkan analisis pekerjaan. Penelitian dilakukan di unit Rekam Medik, unit IGD, dan unit Rawat Inap.

Penilaian secara objektif menggunakan SNI 7269:2009 menunjukkan bahwa beban kerja di unit Rekam Medik 289,96 kkal/jam (sedang), di unit IGD 143,65 kkal/jam (ringan), dan di unit Rawat Inap 119,18 kkal/jam (ringan). Sementara itu, penilaian secara subjektif menggunakan NASA-TLX menunjukkan bahwa beban kerja di unit Rekam Medik 79,75 (tinggi), di unit IGD 82,01 (sangat tinggi), dan unit Rawat Inap 78,40 (tinggi). Pekerjaan dinilai menggunakan Hay Job Evaluation dan menghasilkan skor 295 untuk unit Rekam Medik dan 394 untuk unit IGD dan Rawat Inap. Desain sistem insentif dibangun dengan menentukan rasio tertentu untuk beban kerja dan grade pekerjaan. Dengan mengimplementasikan desain sistem insentif ini, unit dengan grade yang lebih rendah dapat menerima insentif lebih jika rasio yang ditetapkan untuk beban kerja tinggi.

***Kata Kunci**: Beban Kerja, Hay Job Evaluation, Isentif, NASA-TLX, SNI 7269:2009*

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TABLE OF CONTENT

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LIST OF TABLE

LIST OF FIGURE

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CHAPTER 1
INTRODUCTION

This chapter explains about research background, problem formulation, objective determination, benefit, scope, and report outline.

1.1 Background

Human resources are important asset for organization or company as they contribute to improving the system in achieving vision and mission. The company's success in achieving their goal is depend on human resources' ability in carry out the duty. Hence, company should create appropriate situation to motivate their employee in improving working performance. In order to increase human resources' productivity, management should be able to manage and design appropriate development framework for employee to meet optimum performance. Company's performance in managing human resources then can be assessed by looking at their employee's performance report.

Performance assessment basically is a systematic goal and process to collect, analyse, and use of information to determine efficiency and effectiveness of employee's tasks and goal achievement. Bernardin and Russel (1993) state that performance assessment is a way of measuring the contribution of individuals to their organization. In performance management, employee's competency more influence in individual behaviour to finish a task well. Human resource management generally aims to make all members involved in organization or company can work together towards one specific goal. By doing performance assessment, company will be able to know if their employee carry out their duty as desired. Performance assessment also provide company to do work performance improvement, compensation compliance, incentive, also position allocation determination, management, and career development. Furthermore, company may also able to know information about training and development necessity, irrelevance position, and work design error.

Based on Maslow's Hierarchy of Needs, there are five human necessities that can become motivation factor which are basic physiological needs, safety/security needs, social needs, esteem needs, and self-actualization needs (Mousavi and Dargahi, 2013). The most basic need, preliminary need, can be satisfied by an employee for example if their salary already appropriate with their current needs. After the most basic need already fulfilled, then in the second level human will seek for safety. This safety need not only in a form of physical safety but also psychological safety. In real work, safety can be found in the balance of workload with individual's working capacity or supervisor's relationship with their subordinate psychologically.

Based on international research institution, Gallup Worldwide on Table 1.1, only 8% Indonesian workers are highly motivated in their job while the rest of 92% are not. Other country in the world also faced the same result where relatively, only 13% workers are highly motivated (engaged) with their job (Crabtree, 2013). Whereas, from the survey conducted by a certain job portal website, jobDB Indonesia, 73% respondents are unsatisfied with their current job. There are many factors that are able to influence motivation. According to Media Relation Specialist jobDB Indonesia, Yasmin Sungkar in Fajriah (2015), the three most influence factors are salary, facility, and reward. By knowing that salary is the most important aspect for worker to improve performance, this research try to evaluate payroll system in a company by considering existing payroll system and actual workload.

Table 1.1 Motivated Worker Survey by Gallup (2011-2012)

Country	Engaged	Disengaged	Actively Disengaged
Albania	11%±5	69%±6	20%±4
Algeria	12%±6	35%±5	53%±4
Argentina	16%±4	56%±4	28%±3
…	…	…	…
Indonesia	8%±3	77%±3	15%±2

(Source: Crabtree, 2013)

PT Kaltim Medika Utama (PT KMU) is a company engaged in health service field. In 1990, PT KMU was established by the name of Yayasan Rumah Sakit Pupuk Kaltim as independent private hospital in terms of financial. This hospital was newly inaugurated become PT KMU on 1st March 2012. Currently, PT KMU has several business units that spread around East Borneo province such as Rumah Sakit Pupuk Kaltim (RSPKT), *Klinik*, and *Apotik*. Figure 1.1 shows the business units owned by PT Kaltim Medika Utama and distinguished between locations such as Bontang, Samarinda, Kutai Timur, and Balikpapan. This research focused on RSPKT Bontang as one of business unit which as well as pioneer establishment of PT KMU. Moreover, since RSPKT has the longest operation period among other business units, it provides more complex situation and complete historical data.

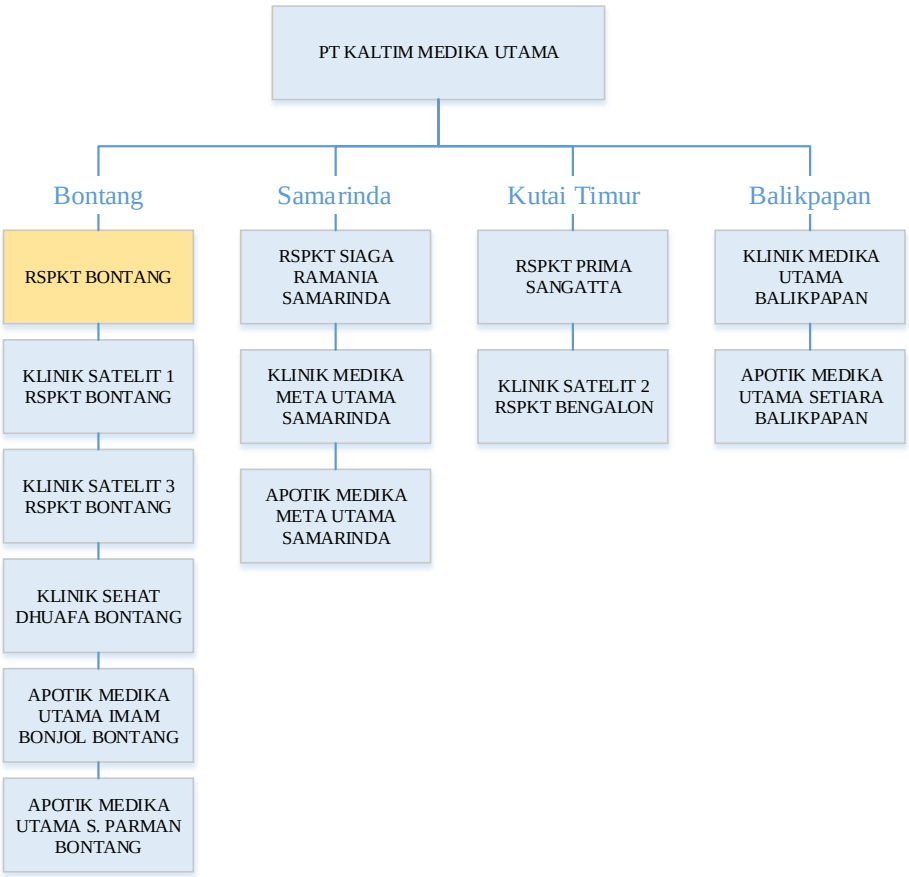

Figure 1.1 Business Units of PT Kaltim Medika Utama

According to Figure 1.2, it can be seen that the number of patients in RSPKT Bontang is increasing every year around 3% until 5% every year. In 2010 there are 121,919 patients, in 2011 there are 134,479 patients, in 2012 there are 141,698 patients, in 2013 there are 147,337 patients, and in 2014 there are 150,285 patients. As the visiting amount is increasing every year, it can be predicted that employees' workload will be also increasing. Moreover, current management policy is optimizing the use of current employee rather than recruiting new employees. Means that if there is a unit which seems lack of manpower, employee from other unit with similar capability will be assigned to fulfil the manpower necessity.

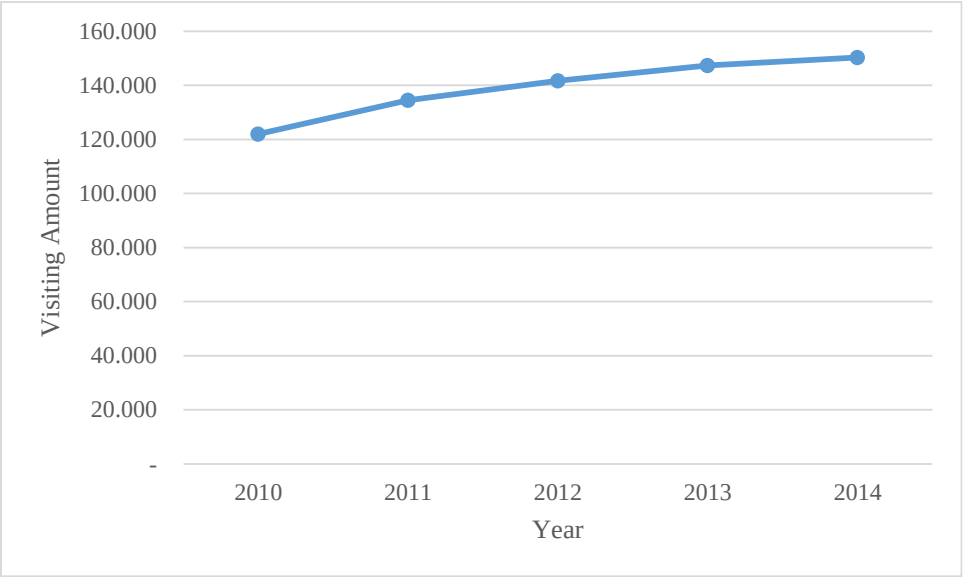

Figure 1.2 Trend of Patiens in RSPKT Bontang (Source: RSPKT's file, 2016)

From the research conducted by Swiger et al. (2016), activities done by medical employee (nurse) majorly are not direct care for patient, instead another activities such as gathering supplies, documenting care, patient transport, task switching, discharge planning, nurse education & training, equipment troubleshooting, and waiting. These conditions are appropriate with RSPKT's

manager observation which feels that most problems are not coming from medical service but instead in their supporting units such as medical record.

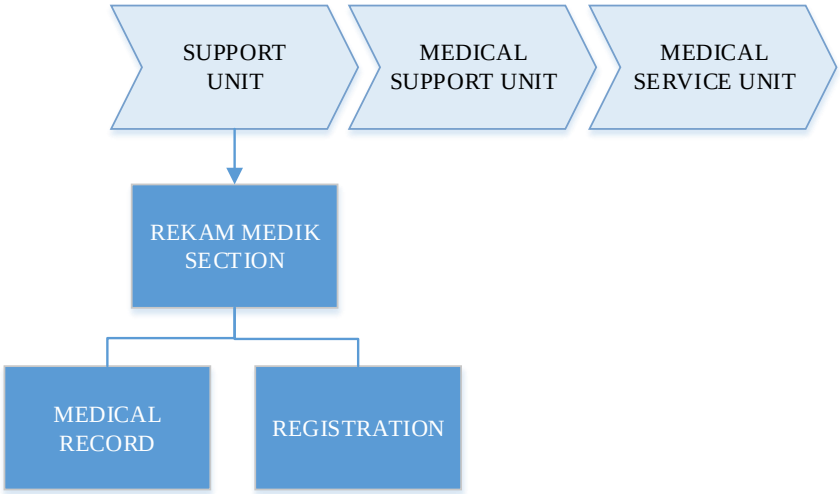

Figure 1.3 Medical Record Section in RSPKT's Business Process

Figure 1.3 shows Medical Record section as a medical support service unit in RSPKT's business process that operated 24 hours per day. In organizational structure of RSPKT, Medical Record unit is divided into two groups which are registration team and medical record team. Registration team consists of a group leader worked as administration, 3 permanent employees, and 1 contract employee. While medical record team consists of a group leader worked as nurse, 8 permanent employees, and 2 contract employees. Both of groups are work together in managing patients' information. As a supporting unit, Medical Record role is important in managing confidential information data about patients that will be used as consideration for management in improving medical service. Therefore, increasing number of visitor (patients) means there are more information to be recorded and will be impacted to their workload.

Workload identification can be done by using objective and/or subjective method. Objective method used quantitative data through observation while subjective method used qualitative data through personal justification. Output of workload study usually gives improvement by increasing or decreasing the number

of worker. However, if company set policy for not changing the number of employee due to efficiency or optimizing existing human resource, that recommendation will be hard to be implemented. Especially for health service organization which mostly consist of employee with specific skills (physicians). Job rotation or scheduling may be able to be implemented between average skill for example ICU nurse with IGD nurse or laboratories administrator with medical record administrator. But, it is impossible to implement between medical specialist such as dentist, oculist, internist, etc. Instead, incentive plan can be considered as a money compensation for them who work over the average workload among other employee. Of course with the assumption that the workload still not excess maximum human capacity. This research want to analyze the workload problem in Medical Record as the observed unit appropriate with RSPKT's suggestion. Identified workload will become consideration in develop incentive plan for them who work above average physical and mental workload.

Besides workload problem, currently RSPKT make several changes in their management system. One policy that intend to be applied is remuneration as a new payroll system. Since the first establishment until now, RSPKT used job grading (*golongan*) payroll system based on experience, education, and position which refers to state-owned enterprise's payroll system. That payroll system already went through several evaluations to adjust with company's necessity. However, the adjustment seems not fair enough in providing reward for existing employee's individual performance since it is given by considering group or company's performance. The existing reward system is provided by consider total performance of the organization, not individual, then divided equally according to 21 level of job grading.

Common reward system can be given as extra pay for extra performance. Means that there is compensation for them who work above average person. Fair pay for person was developed to appreciate individual work performance in fulfilling their task. It is not considering group performance to avoid work discrepancy. If reward system or compensation was given based on group performance, there will be a probability that one person works overload where the

other one works underload. There are many methods that provide compensation design approach for example Hay Job Evaluation.

Murhanindyo (2013) in his research said that Hay Job Evaluation provide fair compensation practice appropriate with U.S. Equal Pay Act of 1963 and "Canadian provincial pay equity legislation" which refer to comparison between position based on skill, responsibility, effort, and working condition. Hay Job Evaluation already tested in many law courts and has proven can be accounted in law. Some organizations in Indonesia that already started to implement this method for example PLN, Pertamina, and Minister of Finance. Output for Hay Job Evaluation is a grading level which consider about skills, thinking challenge, impact to business, and working condition. Hay method capability in develop fair pay for person may able to improve RSPKT's new remuneration system. In this research, Hay Job Evaluation is used to identify job level and give example of base salary used in develop incentive plan. Thus, according to agreement with RSPKT management, research can be done at Medical Record unit as observation object in developing incentive plan considering physical and mental workload which included in the remuneration system.

1.2 Problem Formulation

Based on described background, this research try to measure physical and mental workload of employee using objective and subjective method, then evaluate the job using Hay Job Evaluation method in order to develop incentive system design.

1.3 Objectives

Objectives in this research are:

1. Calculating physical and mental workload of RSPKT's employees using objective and subjective method
2. Implement Hay method for job evaluation
3. Provide incentive plan by considering workload and job evaluation

1.4 Benefits

Benefits that can be obtained from this research are includes:

1. The incentive design can increase employee's motivation
2. As consideration for company to manage employee's allocation based on physical and mental workload
3. Introduce Hay Job Evaluation as job evaluation method or job grading system that can be implemented in the company
4. Improve author's ability in analyzing and evaluating worker motivation

1.5 Research Scope

1.5.1 Boundaries

Boundaries in this research such as:

1. The research was conducted especially in Medical Record unit of Rumah Sakit Pupuk Kaltim Bontang.
2. IGD and Inpatient unit of RSPKT were also observed as comparison.
3. Observations were done to Medical Record unit's job, IGD unit's job, and Inpatient unit's job.
4. RSPKT's payroll component was based on *Buku Perjanjian Kerja Bersama* (Book of Collective Work Agreement) 2012 – 2014.
5. The research was conducted within four months from March until June 2016.

1.5.2 Assumptions

Assumptions used in this research are:

1. The data taken such as organizational structure, business process, policy, and number of employees do not change during research.
2. Observation during research can represent normal condition.
3. Observed job already represent all job in each unit.

1.6 Report Outline

This research report consists of several chapters. Each chapter discusses about the research in a systematic and coherent way in accordance with sequences of activities. The report outline used in this research such as:

CHAPTER 1 INTRODUCTION

This chapter discusses about research background, problem identification, objectives, scope includes limitations and assumptions, also report outline used in the research.

CHAPTER 2 LITERATURE REVIEW

This chapter discusses about theories and concepts that are used as fundamental by researcher. It aims to ease readers in understanding the concept used in this research. Theories used in this research are obtained from various literatures, previous researches, journals, books, and articles. Furthermore, related methods used in this research also described in this chapter.

CHAPTER 3 RESEARCH METHODOLOGY

This chapter discusses about research methodology which describes flow of activity and thinking framework used during the research. Overall, this methodology consists of several steps that arranged systematically to keep the research done smoothly.

CHAPTER 4 DATA COLLECTION AND PROCESSING

This chapter discusses about general overview of research object. It includes the necessary data obtained from company, result from job description analysis, and workload calculation.

CHAPTER 5 DATA ANALYSIS AND INTERPRETATION

This chapter provides analysis and improvement towards research object. The data processing results from previous chapter are explained briefly in this chapter. Then, calculation result and actual condition will be compared.

CHAPTER 6 CONCLUSION AND RECOMMENDATION

This chapter gives conclusions that answer objectives in the first chapter. Furthermore, recommendation will be given for company improvement and next research with similar topic.

CHAPTER 2
LITERATURE REVIEW

This chapter discusses about theories and concepts used as fundamental by researcher**.** Theories used in this research are obtained from various literatures, previous researches, journals, books, and articles. Furthermore, related methods that are used in this research also described in this chapter.

2.1 Workload

According to ergonomic view, working demand and worker capacity should be in an equal state so that sustainable and high working performance can be achieved. The working demand itself should not be too low (underload) or too high (overload). Under workload can lead to boredom while over workload can lead to stress, injury, and also fatigue (Tarwaka et al., 2004). Basically, workload is divided into two: physical workload and mental workload.

2.1.1 Physical Workload

In summary, physical workload is a difference between working demand with worker capacity in term of physical ability of the worker itself. Physical workload can be measured by looking at human body reaction such as heart rate, blood pressure, body temperature, sweating rate, oxygen consumption, and lactic acid content (Wignjosoebroto, 2006). Measurement by calculating body reaction is included in objective category while subjective measurement can be done through questionnaire.

In this research, physical workload is measured using objective workload assessment based on calory necessity guideline from Badan Standardisasi Nasional Indonesia (SNI 7269:2009). Here are the steps to conduct measurement:

1. Observe each activity of worker at least 4 work hours in a day, then take its average value each hour.
2. Calculate and note working activity using stopwatch
3. Workload is assessed using Appendix 1

4. Calculate average workload based on calory needs according to energy consumption using formula (Badan Standardisasi Nasional, 2009):

$$Average\ WK = \frac{(WK_1 \times T_1) + (WK_2 \times T_2) + \cdots + (WK_n \times T_n)}{(T_1 + T_2 + \cdots + T_n)} \times 60\ kcal\ per\ hour \quad (2.1)$$

$$BM\ male = body\ mass\ (kg)\ x\ 1\ kcal\ per\ hour \quad (2.2)$$

$$BM\ female = body\ mass\ (kg)\ x\ 0.9\ kcal\ per\ hour \quad (2.3)$$

$$Total\ Score = average\ WK + BM \quad (2.4)$$

Explanation:

WK	: workload per hour (kcal/hour)
$WK_1, WK_2, \ldots, WK_n$	: workload according to worker activities 1, 2, …, n (minute)
T	: time (minute)
$T_1, T_2, \ldots, T_n$	: time according to worker activities 1, 2, … n (minute)
BM	: basal metabolism, minimum energy consumption for human to life.

The result value from total WK calculation then can be used to categorize workload level based on Table 2.1.

Table 2.1 Physical Workload Category based on Calory Consumption

Physical Workload Category	Calory Consumption
Light	100 – 200 kcal per hour
Medium	200 – 350 kcal per hour
Heavy	350 – 500 kcal per hour

(Source: Badan Standardisasi Nasional, 2009)

After calculate calory necessity, resting time recommendation can be calculated using following formula by Pulat (1992):

$$R = 0 \qquad \textit{for } K < S$$

$$R = \frac{\left(\frac{K}{S}-1\right)\times 100+\frac{T(K-S)}{K-BM}}{2} \qquad \textit{for } S \leq K < 2S$$

$$R = \frac{T(K-S)}{K-BM} \times 1.11 \qquad \textit{for } K \geq 2S$$

(2.5)

Explanation:

R = resting time recommendation (minute)

T = total working time (minute)

K = average energy consumption for work (kcal/minute)

S = accepted standard normal workload (female 4 kcal/minute, male 5 kcal/minute)

BM = basal metabolism (kcal/minute)

Total resting time requirement is usually around 15% of working time. However, that percentage value may depend on job type. For heavy physical normal job, resting time percentage may reach 30% of working time. Then, after obtaining resting time recommendation from Formula 2.5, an age multiplier is required as allowance. Table 2.2 shows the age multiplier for rest periods.

Table 2.2 Age Multiplier for Rest Periods

Age	Multiplier
20 – 30	1.0
30 – 40	1.04
40 – 50	1.1
50 – 60	1.2
60 – 65	1.25

(Source: Pulat, 1992)

2.1.2 Mental Workload

Mental workload is related to psychological aspect of worker in doing their activity. Based on Henry R. Jex in Zadry (2007), workload is a derivation between job duty with maximum mental capacity of a worker in motivated condition. Mental workload when a person doing activities is influenced by type of activity, working situation, respond time, finishing time, motivation level, skill, fatigue, boredom, and performance allowance.

Technically, mental workload can be measured objectively and/or subjectively. Objective measurement means the measurement is conducted by using quantitative data such as heart rate measurement, body liquid, eye movement, and measuring working performance by calculate between error and work rate. In subjective measurement, the data used is qualitative. This measurement is one of psychology approach by using psychology scale to measure mental workload. It can be conducted directly or indirectly (experiment). Subjective mental workload measurement aims to determine the best scale based on experimental calculation through experiment, determine scale difference for different job type, and identify mental workload factors that significantly related. Several methods that can be used for conduct subjective mental measurement such as: NASA-TLX, Harper Qooper Rating (HQR), Task Difficulty Scale, Subjective Workload Assessment Technique (SWAT), Bourdon Wiersma Test etc.

This research used NASA-TLX method in measuring mental workload. NASA-TLX (Tax Load Index) is a subjective workload measurement which is developed by NASA Ames Research Center. This method use multidimensional rating procedure which divide workload based on average weighted of 6 sub scales. Table 2.3 explains those 6 NASA-TLX sub scales.

Table 2.3 NASA-TLX Scaling Factors

Code	Scale	Rating	Description
Object Assessment			
MD	Mental Demand	Low, high	How much mental, perceptual, and concentration activity was required (e.g. thinking, deciding, calculating, remembering, looking, searching, etc.)
PD	Physical Demand	Low, high	How much physical activity was required (e.g. pushing, pulling, turning, controlling, activating, etc.)
TD	Temporal Demand	Low, high	How much time pressure was felt due to the rate of pace at which task occurred (slow or rapid)
Task			
OP	Performance	Poor, good	How successful and satisfied did the person feel when accomplish the task
FR	Frustration Level	Low, high	How insecure, discourage, irritated stressed, and annoyed did the person feel during the task
EF	Effort	Low, high	How hard did the person have to work (mentally and physically) to accomplish their performance level

(Source: Hart and Staveland, 1981)

Mental demand, physical demand, and temporal demand (MD, PD, and TD) sub scales are related with the person who is being measured (object assessment) while own performance, frustration level, and effort (OP, FR, and EF) related with interaction between human and their task. Those six sub scales are rated and weighted in order to obtain final mental workload score. The measurement steps as follow:

1. Rating

Respondent give rating towards six workload indicators subjectively depend on their current feelings. The scale used is between 0 to represent “low” until 100 to represent “high”.

2. Weighting

In the second step, respondent choose one from two pairwise comparison which felt more dominant in causing mental workload. From here, sum of chosen indicators are calculated into weight for each indicator. The fifteenth pairwise comparison are:

1. PD/MD	6. TD/PD	11. TD/FR
2. TD/MD	7. OP/PD	12. TD/EF
3. OP/MD	8. FR/PD	13. OP/FR
4. FR/MD	9. EF/PD	14. OP/EF
5. EF/MD	10. TD/OP	15. EF/FR

3. Score Calculation

Product value for 6 indicators (MD, PD, TD, OP, FR, EF) can be obtained by multiply rating with weight:

$$Product = Rating \times Weight \tag{2.6}$$

Then, weighted workload (WWL) can be calculated such as:

$$WWL = \sum product \tag{2.7}$$

Score is the average WWL which calculated by divide WWL with total weight such as:

$$Score = \frac{WWL}{15} \tag{2.8}$$

Score result can represent mental workload level felt by respondent according to certain category shown at Table 2.4.

Table 2.4 NASA-TLX Workload Category

Workload Category	Score
Low	0 – 9,9
Medium	10 – 29,9
Moderate	30 – 49, 9
High	50 – 79,9
Very High	80 – 100

(Source: Hart and Staveland, 1981)

2.2 Remuneration

From Oxford American Dictionary, remuneration means money paid for work or a service. It usually expressed as wage or salary. Remuneration mechanism basically is a component of reward management aims to attract competent employee, maintain qualified employee, give motivation, and also maintain company's expense.

In human resource management system, Armstrong and Murlis (2004) said that remuneration term is a total earnings received by employee from their company. Generally, remuneration consist of three main components: basic salary, allowance & benefit, and incentive. It also consider three aspects paying system: pay for people, pay for position, and pay for performance. Thus, an employee will earn salary appropriate with their competence, job position in doing the task, and actual performance. Remuneration system tries to create fair payment for employee's contribution in the company.

Remuneration as reward can be paid both directly and indirectly. Example of direct reward payment such as wage or salary, allowance, bonus, or incentive that paid periodically. Indirect reward payment usually in a form of facility, pension compensation, health, holiday, disaster compensation, and so on (Surya, 2004).

Remuneration system based on Surya (2004) in a hospital usually consists of three types:

1. Basic Salary

Basic salary refers as monthly payment received by employee as a fixed cost. The amount is not depend on number of product output. Usually basic salary is determined based on employees: position, group, education level, and experience. This basic salary aims to fulfil basic needs of the employee.

2. Incentive

Incentive refers to additional payment which the amount is derived from number of output. Bigger output will result higher incentive. In a service company, this incentive can be calculated from employee performance such as number of service provided or additional working hour. It aims to give motivation in order to increase employee performance.

3. Merit

Merit refers to monthly or annual appreciation given to the best employee. The amount is based on profit margin. This merit aims to give reward or increase employee welfare.

2.3 Job Analysis

Job analysis is an identification process and determination of detailed job duty, requirement, and relative importance from the duty to the worker. The important concept in conduct job analysis is done to the job itself, not who work in it. Necessary data can be obtained through interview and questionnaire. Then, the analysis result can be obtained in a form of job description or specification. Job analysis aims to determine working procedure related to worker such as determine need of training, compensation, selection procedure, and performance monitoring.

2.3.1 Job Evaluation

Based on Kartika (2014), job evaluation is a systematics way of determining the value of a job related to other jobs in organization. It tries to make a systematic comparison between jobs in order to establish appropriate payroll structure. There are several systems in conducting job evaluation such as:

- Ranking System

  Evaluator observe the description of each evaluated job and construct positions based on importance level towards company.
- Classification System

  Job level is defined to represent a group of jobs.
- Factor Comparison System

  There are five universal factors in determine payroll level: mental requirement, skill, physical requirement, responsibility, and working condition.
- Point System

  Giving numerical value to certain job factors such as necessary knowledge and total value become fundamental weighted assessment of the job.

2.3.2 Hay Job Evaluation

Hay Job Evaluation is current version of point system in job evaluation that already used by more than 8,000 organization to evaluate several levels starting from administration, marketing, technical, professional, managerial, and executive. This method was developed in 1950s by Edward N. Hay. It is one of work evaluation system that mostly used in North America and Europe for various companies such as private, domestic, profit, and non-profit (Hay Group, 2010). Evaluation principal used in this method:

- Position: evaluation of position, not the people
- Standard and Acceptable Job Performance: it assumed that all task were done right and well
- Current work: evaluation of current work, not future plane nor past
- Work contain: not influenced by salary level nor status of position

The main objective from Hay Method Evaluation is helping company in mapping all their role in the company so fairness can be achieved between skills, responsibility, effort, and working condition.

Assessment process of a position is done to look a relative value from weight and responsibility of the position according to factors. Basically, Hay Job Evaluation has three factors which are know-how, problem solving, and accountability. Those three factors can be illustrated such as Figure 2.1.

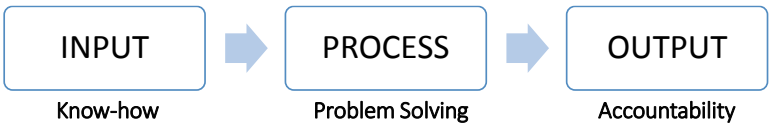

Figure 2.1 Hay Job Evaluation Factors Relationship

In its development, some companies add the fourth factor which is working condition to adjust with regulation related with salary system. Then, those factors have break downed into several dimensions such as Table 2.5.

Table 2.5 Hay Job Evaluation Factors

No	Factor	Dimension	Description
1	Know-How	Total number of knowledge and skill needed for acceptable job performance.	
		Technical Know-How	Practical procedures and knowledge, specialized techniques, and learned skill to achieve desired result.
		Management Knowledge	Planning, coordinating, directing, or controlling the activities as managerial function.
		Human Relation Skill	Communicating and influencing skill needed to interact with individuals or groups both inside and outside organization.
2	Problem Solving	Applying Know-How factors to identify, delineate, and resolve problem.	
		Thinking Environment	The environment which the thinking takes place. Problems and solutions are focused by strategy, policy, precedents, procedures, or rules.
		Analytical Challenge	Complexity of problem faced and difficulty in identifying solution.
3	Accountability	Measured effect of a job to the organization.	
		Freedom to Act	The nature and degree of the decision-making to take action.
		Impact	Nature of the job's influence on business result.
		Magnitude	The portion of total organization influenced by the job.
4	Working Condition	Assessment towards working environment.	
		Physical Effort	Jobs which may require physical activity.
		Physical Environment	Jobs which directly interact with environmental factors which increase the risk of accident, ill, or discomfort.

No	Factor	Dimension	Description
		Sensory Attention	Jobs which require high concentration.
		Mental Stress	Other factor in work process or environment which increase the risk of tension or anxiety.

(Source: Hay Group, 2010)

Refer to research by Murhanindyo (2013), he conducted benchmarking among several companies that use Hay Job Evaluation. Table 2.6 shows range point for each job position.

Table 2.6 Benchmarking of Hay Job Evaluation

Position	Total Point		
	Min	Middle	Max
Director	2,350	3,425	4,500
General Manager	1,560	2,195	2,830
Manager	980	1,325	1,670
Executive	580	1,125	1,200
Supervisor	350	495	640
Staff	170	285	400
Non Staff	80	140	200

(Source: Murhanindyo, 2013)

2.4 Incentive Calculation

Reward for worker can be given in a form of bonus or incentive. Incentive aims to improve and maintain worker motivation in an effort to improve work productivity. It also can be defined as extra pay for extra performance. Here is incentive as a form of wage added to worker's base wage by using following formula from Wignjosoebroto (2006):

$$Total\ Pay = Base\ Wage + Incentive \tag{2.9}$$

Incentive value is the result of base wage multiplied by a bonus percentage. That percentage can be identified by comparing appropriate physical demand, mental demand, and grading level.

2.4.1 Incentive Calculation in Hospital

Based on Bupati Kudus (2015), incentive is an additional earnings for all employees which funding comes from service, pharmacy, and other legal sources. There are direct incentive and indirect incentive. Direct incentive is incentive given to services employees such as physicians, nurses and administrations in each medical unit or installation according to certain proportion while indirect incentive is given to all employee based on index. Support unit such as Medical Record usually used indirect incentive by using following formula:

$$Incentive = \%performance \times Index \tag{2.10}$$

Performance percentage can be obtained through questionnaires or other unit's or hospital's policy while Bupati Kudus (2015) set values for 6 type of index at Table 2.7.

Table 2.7 Index Value for Incentive Calculation

No	Index Types	Grade	Index Value
1	Basic Index	Base salary each Rp 500,000	1
2	Capacity Index	Elementary School	1
		Junior High School	2
		High School	3
		D1	4
		D3	5
		S1/D4	6
		Doctor, Dentist, Pharmacist, Nurse	7
		S2	8
		Doctor Specialist	9
		S3/Subspecialist/Consultant	10
3	Risk Index	Physical risk	1
		Occupational risk	2

No	Index Types	Grade	Index Value
		Contamination risk	4
		Infection & radiation risk	6
4	Emergency Index	Administration	1
		Non shift units	2
		Shift units: inpatient, nutritionist, pharmacy, laboratory, radiology, blood bank	4
		Surgery, ICU, IGD, Obstetric	6
5	Position Index	No position	1
		Head of room and coordinator	2
		Head of sub division, head of section, head of installation	3
		Head of division, head of medical committee	4
		Vice Director	6
		Director	8
6	Performance Index	Additional assessment (such as attendance) or twice Basic Index's value	

(Source: Bupati Kudus, 2015)

Then, each index is rated or weighed according to Table 2.8.

Table 2.8 Weighted Index

No	Index Type	Rate or Weight
1	Basic Index	1
2	Capacity Index	3
3	Risk Index	3
4	Emergency Index	3
5	Position Index	3
6	Performance Index	4

(Source: Bupati Kudus, 2015)

Based on Bupati Bantul (2011), they use medical service income as incentive base calculation by considering individual index and group index.

Medical service income can be obtained according to hospitals' policy. Thus, the incentive formula for medical employees and non-medical employees as follow:

$$Medical\ Incentive = \frac{Individual\ Index}{Medical\ Group\ Index} \times Total\ Medical\ Income$$

$$NonMedical\ Incentive = \frac{Individual\ Index}{NonMedical\ Group\ Index} \times Total\ NonMedical\ Income \quad (2.11)$$

Other incentive calculation by Bupati Bandung (2011) was using total hospital's income (100%) as base and then divided it directly according to following proportion:

1. Medical Service
   a. Physicians : 65.00%
   b. Group : 23.25%
   c. Director : 2.00%
   d. Management : 8.00%
   e. General Cost : 1.75%
2. Support Medical Service
   a. Unit : 45.00%
   b. Group : 43.25%
   c. Director : 2.00%
   d. Management : 8.00%
   e. General Cost : 1.75% (2.12)

2.5 Review of Previous Researches

Previously, several researches with similar topic were already conducted. Summary of those research which used as references in this research can be seen at Table 2.9.

Table 2.9 Previous Researches Summary

No	Author	Research Title	Year	Methods
1	Bimo Dwi Murhanindyo	Desain Sistem Kompensasi Strategis di Perusahaan Pertambangan XYZ	2013	Hay Job Evaluation
2	Ari Kurnia	Penentuan Jenjang Jabatan Pada Jabatan Struktural di PT. Semen X	2014	Hay Job Evaluation
3	Fajar Satrio Susilo	Analisa Kebijakan Remotisasi PLTA Terhadap Perencanaan Manajemen SDM Berdasarkan Pemetaan Beban Kerja dan Hay Method pada UP Brantas, PT. PJB	2015	Hay Job Evaluation, AHP, Fishbone Diagram
4	Desak Made Yunita Dewi	Penentuan Jumlah Optimal Karyawan dan Perhitungan Insentif Berdasarkan Beban Kerja Mental dan Fisik (Studi Kasus: PT Telkom Akses Area Tabanan)	2015	NASA-TLX, Stopwatch Time Study, Gantt Plan

Research by Murhanindyo (2013) discussed about how to create payroll framework for mining company. The author conducted external and internal survey to obtain appropriate salary range based on market condition and worker preference. Then, he created new job grading system in the company using Hay Job Evaluation. Grading point result then compared to other similar company to make sure the value already appropriate. The grading system then used as proportion of how much each position will be paid while salary nominal obtained from survey and adjustment. While Murhanindyo's research only focused on job grading and salary system, the research conducted by author tries to add workload as consideration in develop salary system especially in the incentive component.

Research by Kurnia (2014) discussed about making new grading system for a manufacturing company. It compared the new grading system using Hay Job Evaluation method with existing grading system. Because this research only focused on making new grading system by looking at job description of each position, there is opportunity to improve the research by adding direct observation

to compare it with actual condition. Also this research didn't take consideration of workload problem nor incentive.

Research by Susilo (2015) discussed about human resource planning in response to company policy. It used Hay Job Evaluation to create job grading and also consider about worker workload. Workload calculation conducted using subjective method. The respondents were asked to give rating scale (Likert) for each physical and mental workload they felt during work. Research was done by comparing and adjusting average workload for each position and job grading point. Compare to research proposed by author, this research by Susilo used subjective method to calculate physical and mental workload. This research also didn't consider about incentive payment.

Research by Dewi (2015) discussed about optimizing number of worker in a service company by considering physical and mental workload of worker. Both physical and mental workload were identified using NASA-TLX questionnaire. And then the research also conducted simulation of activity sequence to identify where the bottleneck happen. After adjusting workload with simulation, the optimum number of worker was obtained. The research also provided incentive recommendation by calculating standard working time using Stopwatch Time Study Method and Gantt Plan for incentive calculation. This research has both workload and incentive calculation. However, the workload calculation was done only used subjective method. It also didn't implement Hay Job Evaluation.

By considering previous researches that used to follow subjective method in workload calculation, this research conducted by author tries to add objective method in solving the problem. The problem was identified in one of supporting unit in a hospital. It aims to evaluate physical and mental workload objectively and subjectively, then comparing each job level in the unit using Hay Job Evaluation to suggest appropriate incentive plan for employee.

CHAPTER 3
RESEARCH METHODOLOGY

This chapter discusses about steps of research activities in order to keep the research conducted in a systematic way. The framework also helps to minimize error in writing the report. Figure 3.1 shows the research methodology flowchart.

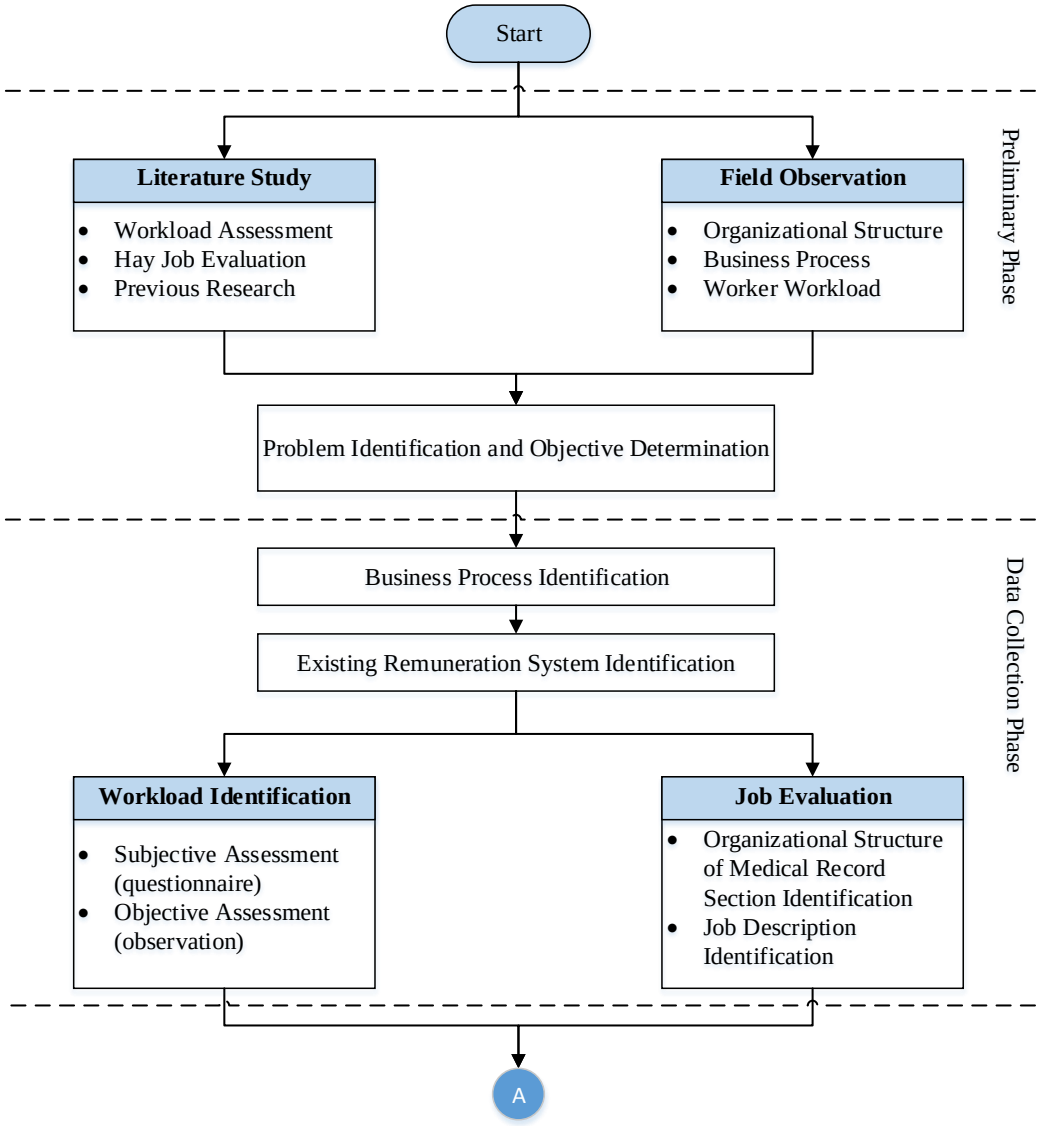

Figure 3.1 Flowchart of Research Methodology

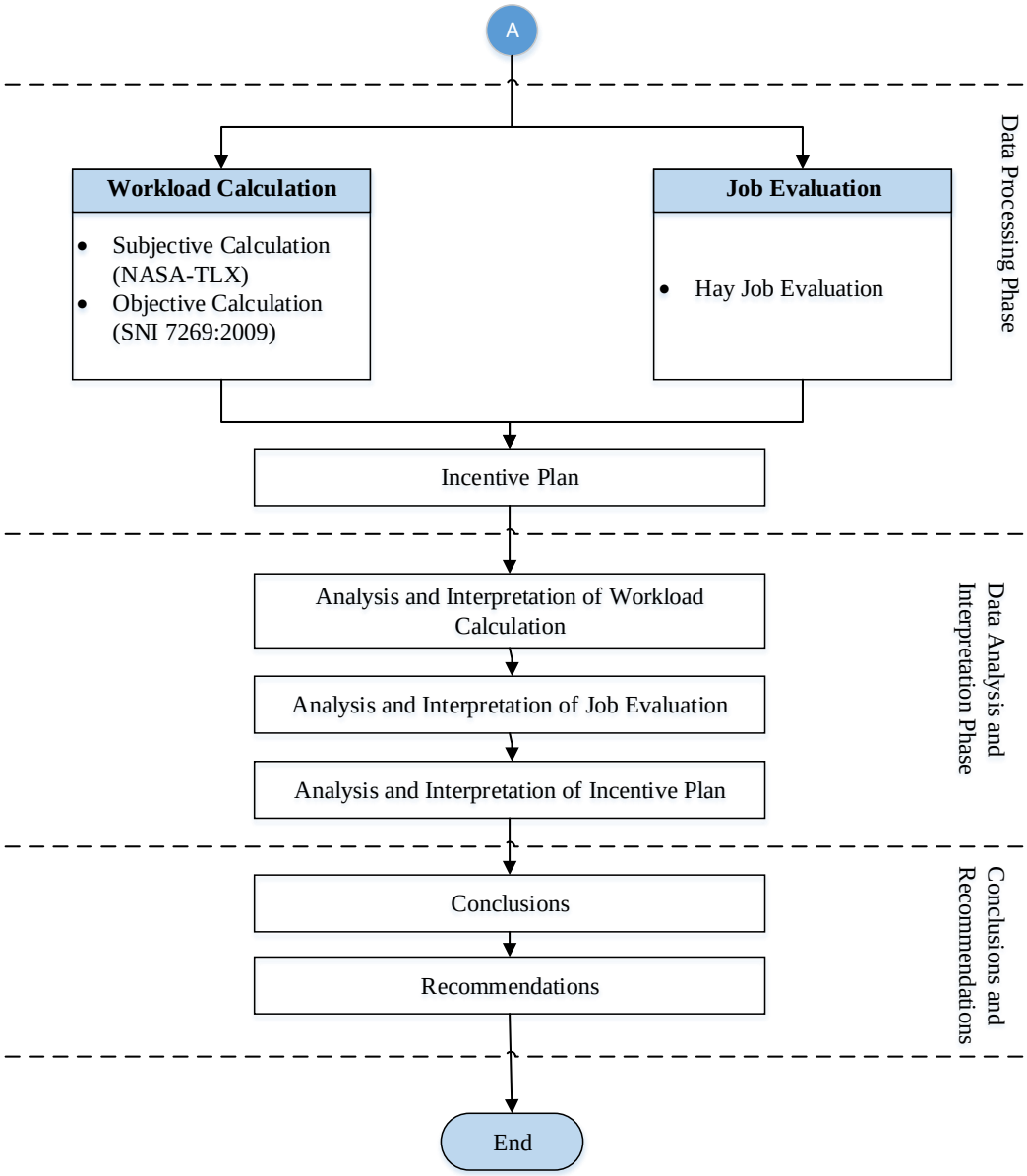

Figure 3.2 Flowchart of Research Methodology (con't)

3.1 Preliminary Phase

In preliminary phase, problem was identified through previous research and preliminary observation in the company. This phase divided into several sub-phases.

3.1.1 Problem Identification and Objective Determination

First of all, problems are identified by comparing common problems happen in hospital with existing condition in Rumah Sakit Pupuk Kaltim especially about workload. Then it can be found that inpatient nurse workload has the most popular study case. However based on discussion with RSPKT manager, they doesn't have really big problem about workload in inpatient nurse. Instead, they suggest Medical Record unit to be observed. Medical Record unit takes care of every patient's information (registration and medical record) and most activity is done manually such as writing, typing, and arranging. Since number of patient visit is increasing every year, it can be expected that workload in Medical Record unit will be also increasing. Moreover, the management has set a policy that there will be no additional employee due to human resource optimization. Thus, incentive plan is selected as a solution for workload problem without changing employees' number.

3.1.2 Literature Study

In this sub-phase, author was studying previous researches, journals, books, and articles to find similar problems and appropriate methods to solve it. The study focused on workload assessment and job evaluation. Here author try to analyze workload in terms of physical and mental. Then, Hay is selected as job evaluation method. There are also previous researches which discuseed about workload and job evaluation for develop incentive plan.

3.1.3 Field Observation

Field observation was done for gathering information about hospital current condition as a study case. Preliminary information that can be obtained such as organizational structure and business process. General information about employee's workload was also obtained, thus additional observation is necessary. From interview with RSPKT's management, there are two problems that can be captured. First, increasing number of patient visit every year may increase Medical Record unit's workload. Second, they are barely set remuneration as new payroll

system. These two problems become main topic in the research to develop incentive plan.

3.2 Data Collection Phase

In this phase, data needed for workload assessment and job evaluation are gathered through questionnaire, observation, and company's file.

3.2.1 Business Process Identification

Business process of Rumah Sakit Pupuk Kaltim is identified in order to have general overview of how the organization is run and how every department/unit is related. Because this research is focused on Medical Record unit which included in supporting service, then it can be found how their activity will impact other unit especially the medical service as core business.

3.2.2 Existing Remuneration System Identification

From previous discussion with RSPKT's management, they are barely set a new remuneration system which related to incentive as additional earnings for employee. It can be found that the existing incentive payment system was designed for individual, thus this research has an opportunity to develop incentive for group.

3.2.3 Workload Identification

The main data needed in this research is workload of Medical Record unit's employees. It obtained through two ways: subjective and objective. Subjective assessment was done by deploying questionnaires for 10 members of Medical Record unit. However, questionnaires also deployed to other units such as IGD and inpatient nurse in order to make comparison of workload level between units. Then objective assessment was done by observing employees in each classification task of Medical Record unit. Questionnaire framework design can be seen at Appendix 2. It divided into three parts: general workload identification, mental workload identification, and fatigue identification. Each part aims to collect information and data about workload from employee's overview. Data that has been gathered become input for workload calculation process.

3.2.4 Job Evaluation

Job evaluation will be done by looking at organizational structure of Medical Record unit and job description. The main data for job evaluation process was job description which contain information about task and duty that must be fulfilled. These information then become input for Hay Job Evaluation method to assess whether that job already appropriate with actual task and duty done by employees. Further discussion with top management also necessary.

3.3 Data Processing Phase

Goal from calculating process in this research was developing incentive system design based on physical workload, mental workload, and job analysis. Thus, this phases can be divided into three sub phases.

3.3.1 Workload Calculation

This research will evaluate two kind of workload which are physical and mental. Based on qualitative data from subjective method and quantitative data from objective method in data collection phase, workload calculation also divided into two. NASA-TLX method is used to calculate both physical and mental workload from individual's perception while SNI 7269:2009 is used to calculate especially physical workload through energy consumption depend on body mass and activity. This sub phase aims to get average workload level in Medical Record section.

3.3.2 Job Evaluation through Hay Method

Job analysis was done through evaluating job description using Hay method. This job evaluation provide tables and chart which indicate severity of task and duty written in the job description. After obtaining total Hay score for each job, then the score was compared with Table 2.2 in Chapter 2 to see if the job already appropriate with job level according to Hay Job Evaluation.

3.3.3 Incentive Plan

Incentive plan was developed by include workload into grading system (scenario 1) or giving bonus for unit with workload above average (scenario 2). Incentive amount was consider available incentive or available money which provided by the hospital. However, since available money is not included in this research, an example was used (e.g. hospital provide Rp 10,000,000 for incentive purpose). Incentive value per unit then calculated by setting specific ratio for workload appreciation and grade appreciation. Beside ratio, number of unit also being considered so incentive available would be enough. After that, simulation by changing ratio for each scenario was done to see incentive effect if workload was considered.

3.4 Data Analysis and Interpretation Phase

This phase explained about calculation result in data processing phase. It discussed about workload assessment result through subjective and objective method, job analysis using Hay Job Evaluation, and incentive plan that has been developed.

3.5 Conclusions and Recommendations Phase

Conclusions from research study were explained briefly according to research objectives. Recommendation also given as consideration for company's management and future research.

CHAPTER 4
DATA COLLECTION AND PROCESSING

This chapter discusses about general overview of research object. It includes the necessary data obtained from company, result from workload calculation, job analysis, and incentive design.

4.1 Company Overview

This sub chapter explain about Rumah Sakit Pupuk Kaltim Bontang (RSPKT) overview as observed company. This includes history, vision and mission, organizational structure, business process, and existing remuneration system.

4.1.1 History, Motto, Vision, and Mission

Previously in year 1979, RSPKT was a First Aid Clinic owned by PT Pupuk Kalimantan Timur. In 1990, RSPKT became a self-financing hospital in a form of institution namely Yayasan Rumah Sakit Pupuk Kaltim (YRS). It aimed to serve especially PT Pupuk Kalimantan Timur's employees and their families, also Bontang community in general. Figure 4.1 shows the current front view of RSPKT.

Figure 4.1 Front View of Rumah Sakit Pupuk Kaltim

In improving competence and professionalism in giving the best service to customer and obeying government regulation which applied on 10th January 2012, RSPKT has officially change form into company namely PT Kaltim Medika Utama (PT KMU). RSPKT management was officially redirected from Yayasan Rumah Sakit to PT KMU on 1st March 2012.

RSPKT motto is "*Kesehatan anda adalah kepedulian kami, kepuasan anda adalah tugas kami, ramah tanggap dan manusiawi adalah layanan kami"* (your health is our concern, your satisfaction is our duty, hospitable and humane is our service).

In running the business, RSPKT has philosophy, vision, mission, and fundamental value

- Philosophy

Hospital service which socially responsible and environmentally knowledgeable, by implement healthy business pattern and prioritize customer satisfaction, employee, shareholder, and community.

- Vision

Become the best hospital in East Borneo, supported by competent and committed human resources, with standardized national service.

- Mission
    1. Organize ethical complete health service plenary
    2. Organize standardized national hospital service
    3. Develop proactive service and reach expansion for all community
    4. Organize hospital management which provide significant benefit for shareholder, employee, and surrounding environment
- Fundamental Value
    1. Integrity
    2. Competence
    3. Responsibility
    4. Concern and Humane
    5. Fair

4.1.2 Organizational Structure

In order to provide systematic overview about work coordination in a company, organizational structure was developed. Positions in organizational structure are divided into structural and functional. Structural position is a position that is written in the organizational structure while functional positions are not written but worked according to independent speciality. In RSPKT's organizational structure, a structural position can act as functional position simultaneously. Means that there were possibility that one person had two or more job descriptions or worked outside their current job description. Figure 4.2 shows the organizational structure of RSPKT.

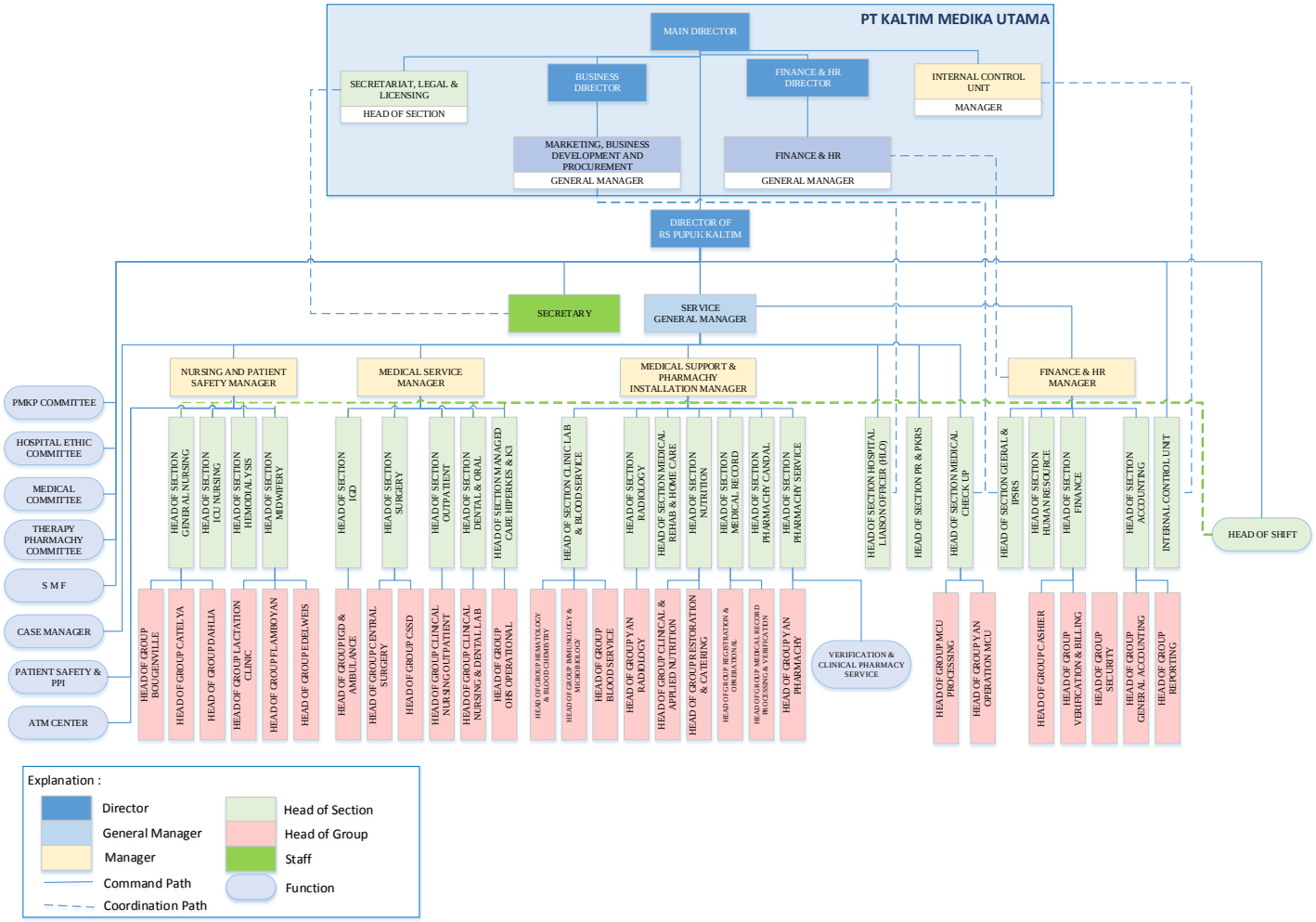

Figure 4.2 Organizational Structure of Rumah Sakit Pupuk Kaltim (Source: RSPKT's file, 2014)

Based on Figure 4.2, several top managements of RSPKT still combined with PT Kaltim Medika Utama such as Main Director; Business Director; Finance & Human Resources Director; Internal Control Unit Manager; Secretariat, Legal, & Licensing Section; Marketing, Business Development, & Procurement General Manager; and Financial, General, & Human Resources General Manager. In the real practice, the Main Director (Director of PT KMU) were also act as Director of RSPKT. Another part that also directed from PT KMU such as Human Resources and Financial, means that this two departments manage all business unit's human resources and financial necessity. For example if RSPKT needs additional human resources, they were not prepare the recruitment their self but prepare the proposal first then PT KMU will do the hiring session. As well as financial terms, RSPKT did not manage their own payroll system. All business units owned by PT KMU in Bontang (see Figure 1.1 in Chapter 1) such as Rumah Sakit Pupuk Kaltim Bontang, Klinik Satelit 1 RSPKT Bontang, Klinik Satelit 3 RSPKT Bontang, Klinik Satelit Dhuafa Bontang, Apotik Medika Utama Imam Bonjol Bontang, and Apotik Medika Utama S. Parman Bontang have their payroll system managed by PT KMU.

In RSPKT, Financial & Human Resources Manager was under Director direct supervision. It was mainly managing internal human resources except recruitment, service billing, and payment. Under Service General Manager, there were Patient Safety and Nursing Manager, Medical Service Manager, and Pharmacy & Medical Support Manager that were managing several section which focused on patient service. Service General Manager also directly supervised HLO, PR & PKRS, and Medical Check Up Sections. Different from financial and human resources, employees in these sections majorly were required to have at least medical knowledge. Several sections then subdivided into several teams. For sections that operates 24 hours, there was head of shift who act as Director makeshift in decision making. Sections which need this head of shift for example Inpatient (General Nursing), ICU, Haemodialysis, Obstetric, IGD, Laboratory, Radiology, Nutritionist, Medical Record, Pharmacy, and Security.

4.1.3 Business Process

RSPKT as medical service company had specific business process with medical care as their main core business. From Figure 4.3, it can be seen that the main business objective was patient's satisfaction.

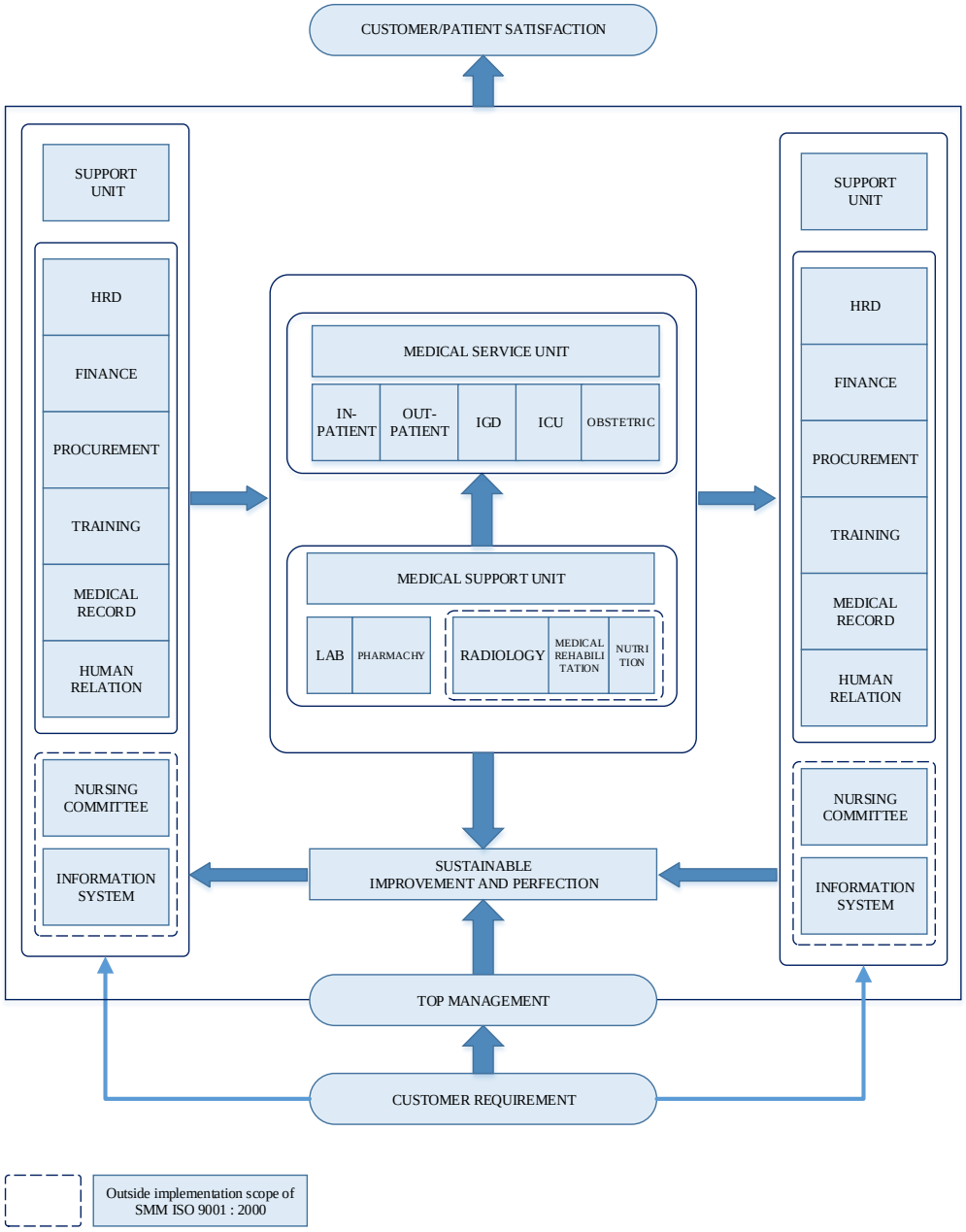

Figure 4.3 Business Process of Rumah Sakit Pupuk Kaltim (Source: RSPKT file)

The core business as shown in Figure 4.3 was the medical service (*unit pelayanan medis*). Medical service unit of RSPKT consists of inpatient (*rawat inap),* outpatient (*rawat jalan*), *IGD, ICU,* and obstetric (*kebidanan*). There was also medical support unit such as Laboratory (*laboraturium),* Pharmacy (*farmasi),* Radiology (*radiologi),* Medical Rehabilitation (*rehabilitasi medis),* and Nutritionist (*gizi).* There were also support units which consists of Human Resource & Development (*Sumber Daya Manusia),* Finance (*keuangan),* Procurement (*pengadaan),* Training (*diklat),* Medical Record (*rekam medik),* Human Relation (*humas),* Nursing Committee (*komite keperawatan*), and Information System (*sistem informasi*). Also in Figure 4.3 there were units inside dash box which means they were outside the implementation of SMM ISO 9001:2000 such as Nursing Committee, Information System, Radiology, Medial Rehabilitation, and Nutritionist. SMM ISO 9001:2000 is a quality management system from international standard organization number 9001:2000 which discussed about requirements and recommendation of design and assessment for quality management system. Based on British Security Industry Association (2001), this standardization aims to ensure that the company gives standardized product or service.

RSPKT business started from customer or patient demand that became top management's consideration in managing overall business. Sustainable service development are done to meet customer requirement. Support Units were came first to make sure that core units will run well and came last to obtain customer's respond after used medical service. The information will be used to improve company's service to meet customer satisfaction.

4.1.4 Demand Characteristic

From previous explanation in sub chapter 1.1 about trend of patients in RSPKT (Figure 1.2), the number of patients were increasing about 3% until 5% every year and the trend was less fluctuating. However, in Figure 4.4, the trend of RSPKT's patients per month in 2016 was more fluctuating especially for new patients.

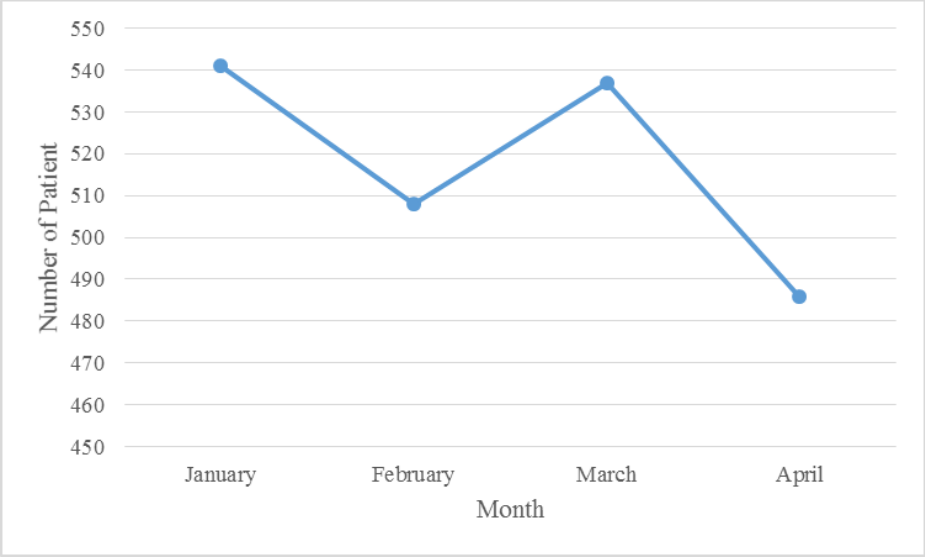

Figure 4.4 Trend of Patients in RSPKT per Month (Source: RSPKT's file)

The number of new patients per month in 2016 based on information system were: January 541 patients, February 508 patients, March 537 patients, and April 486 patients. Number of patients usually increased when there were school holidays on December-January or June-July because most patients used outpatient medical service such as general, oculist, internist, cardiologist, dentist, and so on. However, there was also increment on March 2016 that may cause by other national holiday or emergency situation (accident).

4.1.5 Existing Remuneration System

RSPKT defined remuneration as additional money received by employee apart from fixed salary. This remuneration consists of base wage, fixed allowance, variable allowance, and other income. Table 4.1 shows illustration of payroll components in RSPKT.

Table 4.1 Payroll Components of RSPKT

PAYROLL COMPONENT		
Salary	**+**	**Remuneration**
Fixed Salary	+	Base Wage
		Fixed Allowance
		Variable Allowance
		Other Income

(Source: Rumah Sakit Pupuk Kaltim, 2012)

Fixed salary was determined by *golongan* based on position in the organization. There were 27 *golongan*: 6 Top Managements, 3 Head of Divisions (*golongan* VIIA-VIIC), 3 Head of Sections (*golongan* VIA-VIC), 6 Head of Teams (*golongan* IVA-VC), 3 Officers I (*golongan* IIIA-IIIC), and 6 Officers II (*golongan* IA-IIC). Base wage usually depend on performance or number of medical action performed, welfare, and family allowance. Fixed allowance consists of position allowance, profession, and house. Variable allowance consists of meal and transportation. Other income such as shift, overtime, and specific (vacation, THR, company's performance). Besides income from company's (PT KMU) performance, an employee could receive incentive based on their own individual performance. Income from total company performance were received each three month depend on total company's income, then around 3.88% of that total income were distributed to all employees according to their *golongan*. Whereas, incentive based on individual performance was determined through performance assessment using 360 degree system.

Performance assessment using 360 degree system (*sistem 360 derajat*) was done where all employee assessed other employees performance and their self through questionnaires. Example of one employee, his performance were determined by his own questionnaire's answer and other questionnaires' answers from their co-workers and supervisors. However, shortcoming from this system was

performance assessment majorly depended on employee relationship with other employee. Although others' point of view may represent their actual performance, but it cannot be guaranteed that actual performance in achieving company's or job's goal were appropriate.

4.1.6 Medical Record Section

This research was focused on Medical Record Section which were expected had high workload than other section. From Figure 4.2 about organizational structure, it can be seen that Medical Record Section is divided into two sub sections or teams: Registration & Operational and Medical Record Processing & Verification. Figure 4.5 shows the bigger picture of sub sections in Medical Record Section.

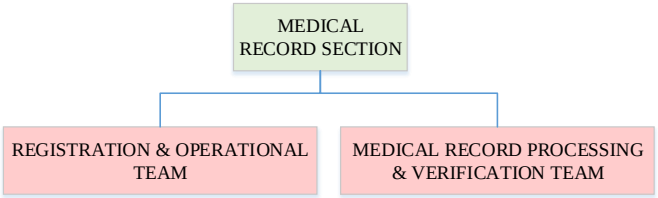

Figure 4.5 Work Classification in Medical Record Section of RSPKT

Registration and Operational Team was focused on direct service to customer or patient while Medical Record Processing & Verification Team was focused on patient's data. Both of teams were work together as an entrance for patient who will use RSPKT's service. In Table 4.2 there were several jobs inside Medical Record Section such as Head of Medical Record Section, Medical Record Reporter, Registration, Assembling, Coding, Filling, and Distribution. Most of those jobs were consist of senior high school graduates. Only several higher position that consists of diploma and undergraduate alumnus. However, for Medical Record Processing & Verification Team employees, they were required to have a bit of nursing knowledge to check whether disease diagnosis was appropriate with medical action or suggested medicine because besides it influence patient's health or recovery, it also influence billing process especially insurance issue. Certain insurance such as BPJS already determined specific medicine for specific diagnosis.

So that if medicine and diagnosis were not appropriate, RSPKT would not be able to charge BPJS.

Table 4.2 Medical Record Section's Permanent Employee

No	Position	Amount
1	Head of Medical Record Section	1
2	Medical Record Reporter	2
3	Registration	3
4	Assembling	1
5	Coding	3
6	Filling	2
7	Distribution	1

(Source; RSPKT's file)

Generally, activity in Medical Record Section can be seen in Figure 4.6. Activity started from patients' reception which divided into three: Regular Patient & PKT Family; New Patient, BPJS, & Inpatient; and Other Insurance. Regular Patient & PKT Family dealt with already registered patients and tended to has short queue as well as Other Insurance. New Patient, BPJS, & Inpatient tended to has longer queue due to administration processing similar with customer service process in a bank.

After registering, patient would receive a copy of registration form while the other one was picked by filing person. Then, the filing person took patient's medical record file from the shelf and prepare additional form. The patient's medical record file usually called 'status'. Then, these status' were delivered to medical service units on foot, by cart, or by bicycle. Patient could use the medical service after their queue number were called. After physicians served the patient and wrote the diagnosis on the status, medical record person came to collect finished status. Every finished status' then were be recorded digitally by coding person. Coding person also checked the suitability of diagnosis with medical action and/or suggested medicine. Then, assembling person would arrange the status' according

to their medical record number and then together with filing person, they returned the status' to medical record shelf.

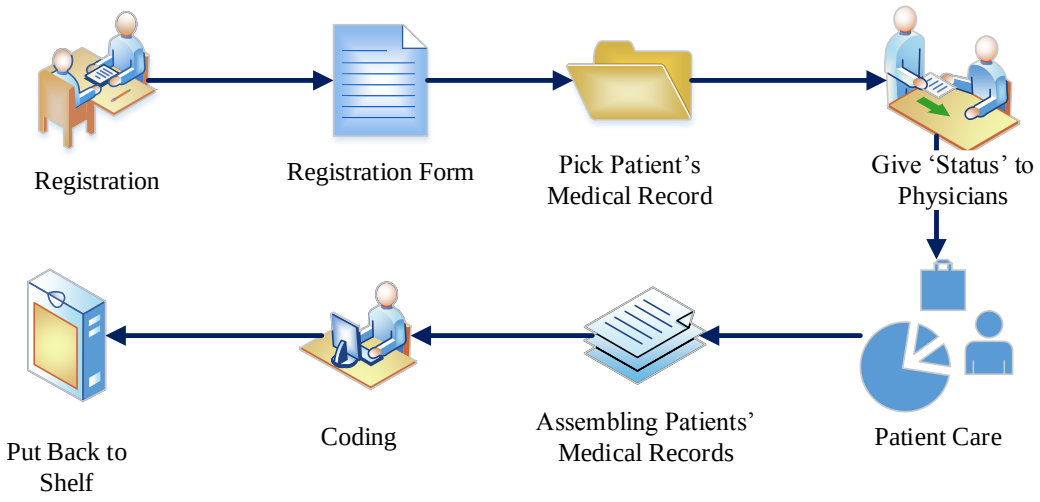

Figure 4.6 General Activity in Medical Record Section

Actually, registration in RSPKT was open at 7 A.M. However, since manager often saw the patients waiting started from 6 A.M., they allow registration employees to work earlier. Figure 4.7 shows the registration activity in RSPKT.

Figure 4.7 Registration Activity in RSPKT

If registration team worked earlier, medical record processing team would follow. They dealt with patients' medical record from picking registration sheet, picking medical record file from shelf, delivering to medical service units, collecting/assembling from medical service units, coding/translate to digital database, and then put it back to medical record shelf according to medical record number. Since outpatient medical services were started from 9 A.M., they usually piled up the status' before delivered it to physicians. Figure 4.8 shows the medical record processing activity.

Figure 4.8 Medical Record Processing Activity

Based on manager observation, Medical Record Section operation was almost exceed working hours especially in Medical Record Processing and Verification Team. This may happen due to increasing number of patients and specific actions that should be done in terms of insurance claim policy. The employees also complained about high workload in the section. Then, observation and questionnaires were done to prove and suggest improvement recommendation.

4.2 Workload Calculation

This sub chapter discusses about workload assessment from direct observation and questionnaires. There were three units that had been assessed to to see the workload characteristic between support unit especially Medical Record Section and medical service unit especially those which deals with emergency such as IGD and Inpatient.

4.2.1 Objective Assessment

Objective workload assessment was generated from SNI method. Body position and activity from observation were compared with Appendix 1 to determine tax type, category, and workload value. The observation was done on random days in April 2016 for 8 work hours or one shift (morning shift). Table 4.3 until Table 4.5 shows objective assessment using SNI 7269:2009 in each Medical Record, IGD, and Inpatient Unit.

Table 4.3 SNI 7269:2009 Calculation in Medical Record Unit

UNIT: Medical Record				Male	40 kg	
No	Body Position & Activity	Task Type	Category	WK	T	(WK) x (T)
1	Sit, writing	1	I	0,6	3,26	1,96
2	Stand, writing	1	I	0,9	8,55	7,69
3	Sit, typing	1	III	1,4	2,92	4,09
4	Sit, arranging forms	3	I	1,55	15,87	24,59
5	Stand, arranging files	4	I	4,35	182,15	792,36
6	Stand, pick files from shelf	3	II	2,85	98,13	279,66
7	Walk, pick registration sheet	0	-	3	42,58	127,73
8	Walk, push file cart	3	III	6,25	121,47	759,16
9	Walk, deliver file to poli	0	-	3	16,05	48,15
Total					490,97	2045,39
Total WK / total T (kcal/minute)					4,17	
Basal Metabolism (kcal/hour)					40,00	
Total Score (kcal/hour)					289,96	
Workload Category					Medium	

Table 4.4 SNI 7269:2009 Calculation in IGD Unit

UNIT: *Instalasi Gawat Darurat* (IGD)				Female	46 kg	
No	Body Position & Activity	Task Type	Category	WK	T	(WK) x (T)
1	Sit, writing	1	I	0,6	121,27	72,76
2	Stand, writing	1	I	0,9	0,11	0,10
3	Sit, typing	1	I	1,4	0,03	0,04
4	Stand, prepare medicine	2	II	2,2	1,93	4,25
5	Stand, arranging forms	3	I	1,85	0,32	0,59
6	Stand, patient care	4	I	4,35	42,00	182,71
7	Walk, push bed	3	III	6,25	4,81	30,05
Total					170,47	290,50
Total WK / total T (kcal/minute)					1,70	
Basal Metabolism (kcal/hour)					41,40	
Total Score (kcal/hour)					143,65	
Workload Category					Light	

Table 4.5 SNI 7269:2009 Calculation in Inpatient Unit

UNIT: Inpatient				Female	57 kg	
No	Body Position & Activity	Task Type	Category	WK	T	(WK) x (T)
1	Sit, writing	1	I	0,6	95,64	57,38
2	Stand, writing	1	I	0,9	23,33	20,99
3	Sit, arranging forms	3	I	1,55	52,09	80,75
4	Stand, patient care	4	I	4,35	10,69	46,49
Total					181,74	205,61
Total WK / total T (kcal/minute)					1,13	
Basal Metabolism (kcal/hour)					51,30	
Total Score (kcal/hour)					119,18	
Workload Category					Light	

Explanation:

WK = Workload (kcal)

T = Time (minutes)

Here are example of physical workload calculation in Inpatient Unit using Formula 2.1 until 2.4.

1. First, calculate basal metabolism (BM) by multiplying body mass of observed employee with 0.9 kcal/hour:

$$BM\ female = body\ mass \times 0.9$$
$$BM\ female = 57 \times 0.9$$
$$BM\ female = 51.3\ kcal/hour$$

2. Calculate average workload (WK) by multiplying workload category based on Appendix 1 with duration of activity in minutes. For example writing in sitting position was included in work using one hand category I, the workload would be 0.6 kcal while in standing position would be 0.9 kcal. Arranging file was included as two-handed activity (*pekerjaan dengan dua lengan)* category I, so

the workload would be 2.55 kcal in sitting position. Patient care was included in activity using body motion or both arms (*pekerjaan dengan menggunakan gerakan tangan)* category I, so the workload would be 4.35 kcal in standing position. Then, each workload was multiplied with duration of activity in minutes. Total workload then divided with total observation time and then multiplied with 60 to get average workload per hour.

$$Average\ WK = \frac{(WK_1 \times T_1) + (WK_2 \times T_2) + (WK_3 \times T_3) + (WK_4 \times T_4)}{(T_1 + T_2 + T_3 + T_4)} \times 60$$

$$Average\ WK = \frac{(0.6 \times 95.64) + (0.9 \times 23.33) + (1.55 \times 52.09) + (4.35 \times 10.69)}{(95.64 + 23.33 + 52.09 + 10.69)} \times 60$$

$$Average\ WK = 67.88\ kcal/hour$$

3. After basal metabolism and average workload were obtained, total score of physical workload was calculated by sum up those basal metabolism with average workload per hour.

$$Total\ Score = BM + Average\ WK$$

$$Total\ Score = 51.3 + 67.88$$

$$Total\ Score = 119.18\ kcal/hour$$

After knowing the average workload score in each Medical Record, IGD, and Inpatient unit, resting time recommendation could be calculated using Formula 2.5 with average energy consumption for work (K) was Average WK without multiplying it by 60 to make it stay kilocalorie per minute. However, the physical workload of all units were still below the standard calory consumption which were Medical Record 4.16 kcal/min, IGD 1.70 kcal/min, and Inpatient 1.13 kcal/min. It means that the current resting time are already appropriate. But, the Medical Record Unit's workload was a bit over the standard normal workload for female employee which is 4 kcal/min. So, resting time estimation for female employee could be calculated. Supposed that Inpatient's nurse was worked in Medical Record, her basal metabolism was 51.3 kcal/hour or 0.855 kcal/minute and she was 56 years old. Then, the estimation resting time calculation become:

$$R = \frac{\left(\frac{K}{S} - 1\right) \times 100 + \frac{T(K - S)}{K - BM}}{2}$$

$$R = \frac{\left(\frac{4.16}{4} - 1\right) \times 100 + \frac{490.97(4.16 - 4)}{4.16 - 0.855}}{2}$$

$$R = 13.88\ minutes$$

Add age allowance with multiplier from Table 2.2 in Chapter 2.

$$R = 13.88 \times 1.2$$

$$R = 16.66\ minutes$$

4.2.2 Subjective Assessment

Subjective workload assessment was generated from NASA-TLX questionnaires. The questionnaires were given to 10 employees in each IGD unit, Inpatient unit, and Medical Record unit with total 30 questionnaires. Number of sample determination was considering number of permanent employees in each unit since incentive system was designed for permanent employee while contract employee had different incentive allocation in company's payroll system policy. There was also agreement with head of unit since there were employees which still take their temporal leave. Number of permanent employees in Medical Record unit was 12, in IGD was 13, and Inpatient was 15. Thus, 10 was able to represent major employees in each unit. More specific, 10 was able to represent 83% of Medical Record employees, 77% of IGD employees, and 67% of inpatient employees. Table 4.6 until Table 4.8 shows the recapitulation of NASA-TLX questionnaires.

Table 4.6 NASA-TLX Calculation in Medical Record Unit

UNIT: Medical Record										
NASA-TLX FACTORS	**EMPLOYEE**									
	E1	**E2**	**E3**	**E4**	**E5**	**E6**	**E7**	**E8**	**E9**	**E10**
Rating										
MD	80	85	99	70	80	80	75	80	90	90
PD	40	25	50	30	30	60	5	40	30	20
TD	90	85	80	70	80	80	80	90	99	99
OP	80	80	90	80	70	70	80	100	90	80
FR	15	20	10	50	20	10	5	70	30	10
EF	80	80	70	80	80	80	80	60	90	90
Weighing										
MD	3	2	5	2	2	4	2	4	4	5
PD	1	1	1	0	2	1	1	0	1	1
TD	5	5	3	4	5	4	5	3	4	3
OP	3	4	4	3	2	2	3	5	2	4
FR	0	0	0	1	0	0	0	2	1	0
EF	3	3	2	5	4	4	4	1	3	2
Score	80,67	78,67	85,67	74,00	72,00	77,33	74,33	86,00	84,40	84,47
Average Score									**79,75**	
Category									**High**	

Table 4.7 NASA-TLX Calculation in IGD Unit

UNIT: *Instalasi Gawat Darurat* (IGD)										
NASA-TLX FACTORS	**EMPLOYEE**									
	E1	**E2**	**E3**	**E4**	**E5**	**E6**	**E7**	**E8**	**E9**	**E10**
Rating										
MD	90	80	100	90	100	80	90	85	90	70
PD	60	70	100	60	100	50	30	70	80	80
TD	100	50	50	70	96	70	80	70	75	60
OP	90	90	100	80	100	70	80	85	73	70
FR	5	30	50	50	90	70	30	80	65	80
EF	20	80	100	80	97	70	90	75	60	60
Weighing										
MD	4	4	4	5	3	4	5	5	5	2
PD	2	2	3	1	4	4	0	0	4	3
TD	5	1	1	2	1	2	3	1	3	1
OP	3	4	0	4	5	2	2	4	2	3
FR	0	0	2	0	0	0	1	3	1	5
EF	1	4	5	3	2	3	4	2	0	1
Score	84,67	79,33	90,00	80,67	99,33	67,33	82,67	81,67	80,40	74,00
Average Score									**82,01**	
Category									**Very High**	

Table 4.8 NASA-TLX Calculation in Inpatient Unit

UNIT: Inpatient										
NASA-TLX FACTORS	**EMPLOYEE**									
	E1	**E2**	**E3**	**E4**	**E5**	**E6**	**E7**	**E8**	**E9**	**E10**
Rating										
MD	50	90	30	30	80	80	80	100	100	80
PD	80	90	50	45	80	100	70	100	100	80
TD	30	50	50	50	80	80	70	80	80	78
OP	90	100	80	95	80	80	90	80	80	88
FR	70	20	30	5	80	80	80	50	80	75
EF	60	80	30	70	80	80	80	100	80	75
Weighing										
MD	0	3	1	1	1	5	5	5	5	3
PD	2	3	3	2	3	2	4	4	4	2
TD	3	0	4	3	2	3	1	3	3	3
OP	5	4	5	5	3	1	1	1	1	2
FR	3	1	0	0	1	2	2	0	0	4
EF	2	4	2	4	5	2	2	2	2	1
Score	68,67	85,33	56,00	68,33	80,00	82,67	77,33	94,67	92,00	79,00
Average Score									**78,40**	
Category									**High**	

Explanation:

E1, E1,.., E10 = Employee 1, Employee 2,…, Employee 10

MD = Mental Demand

PD = Physical Demand

TD = Temporal Demand

OP = Performance

FR = Frustation

EF = Effort

Here is calculation example for Employee 6 in Medical Record Unit using Formula 2.6 until 2.8 from sub chapter 2.1.2

$$Product = Rating \times Weight$$

$$MD = 80 \times 4$$

$$MD = 320$$

$$WWL = \sum product$$

$$WWL = MD + PD + TD + OP + FR + EF$$

$$WWL = (80 \times 4) + (60 \times 1) + (80 \times 4) + (70 \times 2) + (10 \times 0) + (80 \times 4)$$

$$WWL = 320 + 60 + 320 + 140 + 0 + 320$$

$$WWL = 1160$$

$$Score = \frac{WWL}{15}$$

$$Score = \frac{1160}{15}$$

$$Score = 77.33$$

After workload score for ten employees were obtained, average score for Medical Record unit was calculated by sum up the total score and then devide it with number of employees assessed.

$$Average\ Score = \frac{\sum score}{10}$$

$$Average\ Score = \frac{80.67 + 78.67 + 85.67 + 74.00 + 72.00 + 77.33 + 74.33 + 86.00 + 84.40 + 84.47}{10}$$

$$Average\ Score = 79.75$$

Based on Table 2.4 in Chapter 2, score 79.75 was included as High mental workload.

4.2.3 Summary of Objective and Subjective Assessments

After obtaining workload category from objective and subjective assessments, workload summary of Medical Record, IGD, and Inpatient unit can be created such as Table 4.9.

Table 4.9 Workload Summary

	Medical Record	**IGD**	**Inpatient**
Objective Assessment	Medium	Light	Light
Subjective Assessment	High	Very High	High

4.3 Hay Job Evaluation

This sub chapter discuss about comparison between actual workload that has been assessed and written job description in Medical Record section. Medical Record section was chosen because they have moderate physical workload and high mental workload in normal condition (not emergency) which lead to more higher workload when there is emergency situation.

4.3.1 Job Description

This research used Hay method as Job Evaluation method. The input needed for this method was job description or summary. Each job in the same sub section or teams has similar job, thus one job description could represent all job in the team. Table 4.10 shows job summary of Medical Record Administrator. For comparison, job from other unit also assessed. This research used nurse as comparison because both of them were considered as executive/officer but had different skill level. Table 4.11 shows the job summary of Nurse III (junior nurse).

Table 4.10 Summary of Medical Record Administrator's Job Specification

Position	Medical Record Administrator
Qualification	D III Medical Record
Job Objectives	• Create valuable report in terms of administration, medical, law, financial, research, and documentation. Result report should be informative, accurate, accountable, and on time and can be used as fundamental for manager in decision making.
Duty and Responsibility	• Prepare data for reporting requirement • Collect data from daily census for recapitulation • Create Report Operational and Recapitulation of Rumah Pupuk Kaltim report

	• Create report of Morbidity and Mortality with employee and co-enterprise family • Give disease code according to ICD X in outpatient and inpatient diagnose • Reviewing report from other unit before processing hospital's report • Reject medical record file request without borrowing, requesting, or registration letter • Reject patient's data/information request without request letter to Medical Director
Skill, Knowledge, & Ability	• Training: hospital information system reporting, advance ICD X. • Technical skill: fundamental statistic, able to operate computer software such as Microsoft Word and Excel, epidemiology, medicine and nursing terminology. • Competence (soft skill): healthy body and spirit, careful, diligent, patient, friendly. Has experience in hospital information system reporting minimum 1 year.
Challenge	• This job should make sure that the daily report are done by head of room so that the data are appropriate with actual condition. • This job should give specific socialization about computerization system so every units are able to input data completely and consistent. • If data is inappropriate with related units, error may happen when manager prepares hospital development plan.
Human Relation	• Internal relation with outpatient nurse, doctor, head of outpatient unit, head of inpatient unit. For data changing or adding. Once a month. • External relation with patient, *puskesmas*, enterprise public health office (*Dinas Kesehatan Perusahaan*) cooperating with RSPKT.
Working Condition	• This job work in quiet comfortable environment in an indoor space. Mental stress often happen due to concentration needs and deal with deadline.

Table 4.11 Summary of Nurse III Job Specification

Position	Nurse III Inpatient Unit
Qualification	• D III Nursing • Experiencing minimum as a novice nurse for 3 years
Job Objectives	• Perform nuring care according to standard, target, and patient's satisfaction.

Duty and Responsibility	• Doing nursing assessment, maintain nursing diagnose, create nursing planning, perform nursing care or collaborative action according to the needs refer to hospital's patient safety policy. • Doing nursing evaluation and observe patient's condition, then perform proper action according to observation result and communicate with responsible physician. • Accepting new patient according to procedure and doing orientation to patient/family about: patient's rights and obligations, nurse's name, facilities, and regulation. • Create note and report about nursing and/or collaborative action • Give health education to patient and their family according to situation and collaborative needs with other medics. • Participate with other medic teams in discussing problem and improvement service quality effort. Also improve nursing knowledge and ability. • Doing morning, afternoon, and night duty on schedule. Doing task handover written and orally according to procedure. Also participate in regular meeting with head of team or head of section. • Doing administration activity related with service such as input nursing action in SIM, completing patient discharge resume, control letter, patient reference answer, insurance completion, and billing back up completion. • Doing emergency action to patient according to procedure, give direction to internship student, and maintain a clean, safe, and comfort environment for patient.
Skill, Knowledge, & Ability	• Training: PPGD, nursing management, customer service/satisfaction, computer • Technical knowledge/skill: dosage calculation, medical equipment operation such as syringe pump, infusion pump, liquid balance calculation, CVP measurement, Vital Sign monitor operation. • Competence/soft skill: customer satisfaction, communication
Challenge	• Complain from patient/family • Emergency situation • Responsible physician is difficult to contact • Patient difficult to understand medical action planning that is going to be taken • Crowded outside working hour • If this job fail to do physician's instruction, patient's recovery may be disrupted • If this job fail to calculate medicine dosage, patient's recovery may be disrupted

	• If this job fail to input medical action data in SIM, there will be error in billing or payment amount
Human Relation	• Internal relation with head of nurse, head of shift, medical specialist, case manager, nutritionist, laboratory, and radiology. • External relation with patient and their family.
Working Condition	• This job work in quiet comfortable environment in an indoor space. Mental stress often happen due to concentration needs, emergency, and social relation with patient. Physical effort may needed in patient transfer, patient care, and meal distribution.

4.3.2 Hay Grading Score

After obtaining job description, the job could be assessed using Hay guideline such as Appendix 3. Additional interview with top management may needed to develop ideal Hay score for each units. Table 4.12 shows the Hay scoring for Medical Record Administrator while Table 4.13 shows the Hay scoring for Nurse III (junior nurse).

Table 4.12 Hay Scoring for Medical Record Administrator

Position: Medical Record Administrator				
Hay Factors	**Dimension**	**Range Level**	**Level**	**Point**
Know How	Technical Know-How	A-H	D	175
	Management Knowledge	0-V	I	
	Human Relation Skill	1-3	3	
Problem Solving	Thinking Environment	A-H	D	43
	Analytical Challenge	1-5	2	
	%		25%	
Accountability	Freedom to Act	A-H	C	50
	Impact	A/C/S/P	A	
	Magnitude	M-5	3	
Working Condition	Physical Effort	A-D	A	5
	Physical Environment	A-D	A	5
	Sensory Attention	A-D	B	9
	Mental Stress	A-D	B	8
TOTAL POINT				295

Table 4.13 Hay Scoring for Nurse III

Position: Nurse III				
Hay Factors	**Dimension**	**Range Level**	**Level**	**Point**
Know How	Technical Know-How	A-H	E	200
	Management Knowledge	0-V	I	
	Human Relation Skill	1-3	3	
Problem Solving	Thinking Environment	A-H	D	66
	Analytical Challenge	1-5	3	
	%		33%	
Accountability	Freedom to Act	A-H	E	100
	Impact	A/C/S/P	A	
	Magnitude	M-5	3	
Working Condition	Physical Effort	A-D	B	8
	Physical Environment	A-D	A	5
	Sensory Attention	A-D	A	3
	Mental Stress	A-D	C	12
TOTAL POINT				394

Here are the step-by-step example of Hay assessment for Medical Record Administrator:

1. Know How Assessment

   The first Hay factor that should be assessed was Know-How factor. It consisted of three dimensions started from Technical Know-How, Management Knowledge, and Human Relation Skill.

   a. Technical Know-How Assessment

      From description of KNOW-HOW : TECHNICAL KNOW-HOW in Appendix 3, find the most appropriate level based on the job description. Advanced Vocational (level D) was chosen because this job needs process or system knowledge to prepare reports from medical service units, also this job needs additional training about diagnosis code.

   b. Management Knowledge Assessment

      From description of KNOW-HOW : MANAGEMENT KNOWLEDGE in Appendix 3, find the most appropriate level based on the job description.

Minimal (level I) was chosen because this job's activity had similar goal, similar content, and enough awareness for other activities.

c. Human Relation Skill

From description of KNOW-HOW : HUMAN RELATION SKILL in Appendix 3, find the most appropriate level based on the job description. Critical (level 3) was chosen because this job needs to influence several people to have good teamwork in provide appropriate report for RSPKT's development.

After deciding levels for each Know-How's dimension, find Know-How Score through the KNOW-HOW GUIDE CHART in Appendix 3.

				MANAGEMENT KNOWLEDGE								
				N. None			I. Minimal			II. Related		
			HUMAN RELATION SKILL	1	2	3	1	2	3	1	2	3
SCIENTIFIC DISCIPLINE	SPECIALIZED TECHNIQUES	PRACTICAL PROCHEDURES	A	38 43 50	43 50 57	50 57 66	50 57 66	57 66 76	66 76 87	66 76 87	76 87 100	87 100 115
			B	50 57 66	57 66 76	66 76 87	66 76 87	76 87 100	87 100 115	87 100 115	100 115 132	115 132 152
			C	66 76 87	76 87 100	87 100 115	87 100 115	100 115 132	115 132 152	115 132 152	132 152 175	152 175 200
			D	87 100 115	100 115 132	115 132 152	115 132 152	132 152 175	152 175 200	152 175 200	175 200 230	200 230 264
TECHNICAL KNOW HOW												

LESS LIKELY MOST LIKELY

Figure 4.9 Illustration of Know-How Factor Assessment

It can be seen in Figure 4.9 there are three score choices 152, 175, or 200. Assessor might choose it subjectively based on explanation in the left side of the chart whether the job needs scientific disciplines, specialized techniques, or

practical procedures. Then, specialized technique was chosen and the score become 175 for Know-How factor assessment.

2. Problem Solving Assessment

After obtaining score for Know-How factor, the next assessment was Problem Solving factor. It consisted of two dimensions which were Thinking Environment and Analytical Challenge. Combination of these dimensions then provided a percentage. Then the percentage was combined with Know-How factor's score to obtain Problem Solving score.

a. Thinking Environment Assessment

From description of PROBLEM SOLVING : THINKING ENVIRONMENT in Appendix 3, find the most appropriate level based on the job description. Standardized (level D) was chosen because this job was already in the established procedure and standard, also able to solve general problem through experience.

b. Analytical Challenge Assessment

From description of PROBLEM SOLVING : ANALYTICAL CHALLENGE in Appendix 3, find the most appropriate level based on the job description. Patterned (level 2) was chosen because this job usually faced the same situation or problem that can be solved through options from experience.

After deciding levels for each Problem Solving's dimension, find Problem Solving percentage through the PROBLEM SOLVING GUIDE CHART in Appendix 3.

		ANALYTICAL CHALLENGE					
		1. REPETITIVE		2. PATTERNED		3. INTERPOLATIVE	
THINKING ENVIRONMENT	A. HIGHLY STRUCTURED	10%	12%	14%	16%	19%	22%
	B.ROUTINE	12%	14%	16%	19%	22%	25%
	C. SEMI-ROUTINE	14%	16%	19%	22%	25%	29%
	D. STANDARDIZED	16%	19%	22%	25%	29%	33%
	E. CLEARLY DEFINED	19%	22%	25%	29%	33%	38%
	F. GENERALLY DEFINED	22%	25%	29%	33%	38%	43%
	G. BROADLY DEFINED	25%	29%	33%	38%	43%	50%
	H. ABSTRACT	29%	33%	38%	43%	50%	57%

LESS LIKELY MOST LIKELY

Figure 4.10 Illustration of Problem Solving Factor Assessment

It can be seen in Figure 4.10 there are percentage choices of 22% or 25%. Assessor might choose it subjectively based on how patterned the job was. Then, 25% was chosen. After determined Know-How score and Problem Solving percentage, intersection was determined from chart as shown in Figure 4.11.

% PS	IND PROBLEM SOLVING POINTS, READ OFF WHERE KNOW-HOW SCORE AND PROBLEM SOLVING% INTERS																			
	KNOW-HOW POINTS																			
	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460	528
87%	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460
76%	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400
66%	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350
57%	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304
50%	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264
43%	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230
38%	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200
33%	12	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175
29%	10	12	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152
25%	9	10	12	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132

LESS LIKELY MOST LIKELY

Figure 4.11 Illustration of Know-How and Problem Solving Factor Intersection

Based on Figure 4.11, intersection between Know-How score of 175 and Problem Solving percentage of 25% produce the Problem Solving score of 43.

3. Accountability Assessment

After obtaining score for Know-How and Problem Solving factor, the next assessment was Accountability factor. It consisted of three dimensions started from Freedom to Act, Impact and Magnitude.

a. Freedom to Act Assessment

From description of ACCOUNTABILITY : FREEDOM TO ACT in Appendix 3, find the most appropriate level based on the job description. Level C was chosen because this job obeys existing instruction to create reports for RSPKT's manager.

b. Impact Assessment

From description of ACCOUNTABILITY : IMPACT in Appendix 3, find the most appropriate level based on the job description. Level A was chosen because this job was specialized in giving information to be used by manager.

c. Magnitude Assessment

From description of ACCOUNTABILITY : MAGNITUDE in Appendix 3, find the most appropriate level based on the job description. Level 3 was chosen because result from report provides by this job would influence manager's policy in providing service for patient and manage departments or units in RSPKT.

After deciding levels for each Accountability's dimension, find Accountability score through the ACCOUNTABILIY GUIDE CHART in Appendix 3.

		MAGNITUDE															
		M. Minimal				1. Very Small				2. Small				3. Medium			
		up to 10 Million				10 - 100 Million				100 Million - 1 Billion				1 - 10 Billion			
	IMPACT	A	C	S	P	A	C	S	P	A	C	S	P	A	C	S	P
FREEDOM TO ACT	A	8 9 10	10 12 14	14 16 19	19 22 25	10 12 14	14 16 19	19 22 25	25 29 33	14 16 19	19 22 25	25 29 33	33 38 43	19 22 25	25 29 33	33 38 43	43 50 57
	B	12 14 16	16 19 22	22 25 29	29 33 38	16 19 22	22 25 29	29 33 38	38 43 50	22 25 29	29 33 38	38 43 50	50 57 66	29 33 38	38 43 50	50 57 66	66 76 87
	C	19 22 25	25 29 33	33 38 43	43 50 57	25 29 33	33 38 43	43 50 57	57 66 76	33 38 43	43 50 57	57 66 76	76 87 100	43 50 57	57 66 76	76 87 100	100 115 132

LESS LIKELY MOST LIKELY

Figure 4.12 Illustration of Accountability Assessment

From illustration in Figure 4.12 there are three score choices 43, 50, or 57. Assessor might choose it subjectively based on combination of Freedom to Act and Impact. Then, 50 was chosen for Accountability score.

4. Working Condition Assessment

Working Condition assessment was the last factor to be assessed after obtaining score for Hay main factors which were Know-How, Problem Solving, and Accountability. This Working Condition factor consisted of Physical Effort, Physical Environment, Sensory Attention, and Mental Stress.

a. Physical Effort Assessment

From description of WORKING CONDITION : PHYSICAL EFFORT in Appendix 3, find the most appropriate level based on the job description. Level A was chosen because this job worked mostly in sitting position in an indoor location (there is air conditioner) in a long time, around 6 to 8 work hours long.

b. Physical Environment Assessment

From description of WORKING CONDITION : PHYSICAL ENVIRONMENT in Appendix 3, find the most appropriate level based on the job description. Level A was chosen because this job worked in a quiet

comfortable environment with low risk of work accident. The job environment would not change during work hours.

c. Sensory Attention Assessment

From description of WORKING CONDITION : SENSORY ATTENTION in Appendix 3, find the most appropriate level based on the job description. Level B was chosen because this job mostly used hand or fingers to type and eyes to carry out its duty. In needs moderate concentration.

d. Mental Stress Assessment

From description of WORKING CONDITION : MENTAL STRESS in Appendix 3, find the most appropriate level based on the job description. Level B was chosen because this job usually had pressure in terms of deadline, but this job also needs to deal with both co-workers and managers in preparing valuable reports that can cause mental stress.

After deciding levels for each Working Condition's dimension, find Working Condition score through the WORKING CONDITION GUIDE CHART in Appendix 3. Score number can be decided subjectively based on frequency or duration of assessed job's activity. Each Physical Effort, Physical Environment, Sensory Attention, and Mental Stress has the same guide chart to generate score.

Physical Effort Physical Environment Sensory Attention Mental Stress	Level of Intensity	Combination of Frequency and Duration Expressed in Hours per Day				
		< 1	1 - 2	2 - 4	4 - 6	> 6
		< 15%	15% - 25%	25% - 50%	50% - 75%	> 75%
	A. Minimal	1	2	3	4	5
	B. Moderate	6	7	8	9	10
	C. Substansial	12	14	16	19	22
	D. Extreme	25	29	33	38	43

Physical Effort Physical Environment Sensory Attention Mental Stress	Level of Intensity	Combination of Frequency and Duration Expressed in Hours per Day				
		< 1	1 - 2	2 - 4	4 - 6	> 6
		< 15%	15% - 25%	25% - 50%	50% - 75%	> 75%
	A. Minimal	1	2	3	4	5
	B. Moderate	6	7	8	9	10
	C. Substansial	12	14	16	19	22
	D. Extreme	25	29	33	38	43

Figure 4.13 Illustration of Working Condition Assessment

Physical Effort Physical Environment Sensory Attention Mental Stress	Level of Intensity	Combination of Frequency and Duration Expressed in Hours per Day				
		< 1	1 - 2	2 - 4	4 - 6	> 6
		< 15%	15% - 25%	25% - 50%	50% - 75%	> 75%
	A. Minimal	1	2	3	4	5
	B. Moderate	6	7	8	9	10
	C. Substansial	12	14	16	19	22
	D. Extreme	25	29	33	38	43

Physical Effort Physical Environment Sensory Attention Mental Stress	Level of Intensity	Combination of Frequency and Duration Expressed in Hours per Day				
		< 1	1 - 2	2 - 4	4 - 6	> 6
		< 15%	15% - 25%	25% - 50%	50% - 75%	> 75%
	A. Minimal	1	2	3	4	5
	B. Moderate	6	7	8	9	10
	C. Substansial	12	14	16	19	22
	D. Extreme	25	29	33	38	43

Figure 4.14 Illustration of Working Condition Assessment (con't)

Summary of Medical Record Administrator and Nurse can be seen at Table 4.14.

Table 4.14 Hay Score Summary

Job	Hay Score
Medical Record Administrator	295
Nurse III	394

4.4 Incentive System Design

After obtaining workload category and Hay score, incentive system design for each unit or group were developed. Incentive system design per group was developed because workload and Hay score in the previous calculation also calculated for group. There were two incentive system design plans: first the workload was included in the grading system to determine incentive allocation, second the workload was used to give incentive for those who work above specific workload level. Both incentive design plan was developed to allocate available incentive in the remuneration for grade appreciation and workload appreciation. Formula 4.1 shows illustration for incentive allocation.

$$I_A = I_w + I_g \tag{4.1}$$

Where I_A was available incentive or incentive allocation that was determined by company. For example company set Rp 10,000,000 for incentive purpose or company set 3.88% from company's total income for incentive purpose. Then, I_g was incentive for grade appreciation and I_w was incentive for workload appreciation. Logically, this equation would allow 100% I_A to be allocated into I_g and I_w with specific proportion or ratio which not excess I_A value. The ratio was determined subjectively based on company preferences. Formula 4.2 and Formula 3.4 illustrated I_A as 100% while I_g and I_w was determined based on specific ratio (r).

$$I_A = I_w + I_g$$
$$100\%.I_A = r.I_A + (100\% - r).I_A \tag{4.2}$$

Thus,

$$I_w = r.I_A$$
$$I_g = (100\% - r).I_A \quad (4.3)$$

In this research, workload consisted of objective and subjective, then they were combined to obtain how severe was the workload combination. First, workload level was obtained by translating workload category (eg. light, moderate, high) into number. Small number indicated low workload while large number indicate high workload. Table 4.15 shows workload category from workload calculation and Table 4.16 shows workload categories that already translated into level.

Table 4.15 Objective and Subjective Workload Category

Unit	Objective Assessment	Subjective Assessment
Medical Record	Medium	High
IGD	Light	Very High
Inpatient	Light	High

Table 4.16 Objective and Subjective Workload Level

Unit	Objective Assessment	Subjective Assessment
Medical Record	2	4
IGD	1	5
Inpatient	1	4

Since in objective assessment there are 3 categories, then light category was considered as 1, medium was 2, and high was 3. In subjective assessment there are 5 categories, then low category was considered as 1, medium category was 2, moderate was 3, high was 4, and very high was 5. Then, objective and subjective workload were combined into new workload category by multiplying the objective workload level with subjective workload. Multiplying objective level with

subjective level allows new workload combination in a unit become more different if compared to other unit. Table 4.17 provide workload combination value.

Table 4.17 Objective and Subjective Workload Combination

Objective	**Subjective**				
	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15

Actually in combining objective and subjective, it is better to put certain ratio since objective was obtained from observation (actual condition) while subjective was obtained from human's perception. Thus, ratio for objective was usually set higher than subjective. However, number of objective category and subjective category should be equal. Logically, 50% from 3 was different with 50% from 5. This condition would make assessment with 5 category produce higher value.

4.4.1 Incentive System Design 1

The first incentive system design tried to include workload as a part of grading system because usually the incentive amount was influenced by grade. In this research, Hay score was used as the basic grading score. However, this research also try to put actual workload in the grading system to make it appropriate with actual condition. Categorization was developed so that both workload and grade had equal level. Step-by-step calculation of first incentive system design such as:

First, translate workload combination into 5 categories using general formula of range order:

$$Interval\ (I) = \frac{Range\ (R)}{Category\ (C)}$$

$$Range\ (R) = highest\ score - lowest\ score$$

$$Category\ (C) = desired\ number\ of\ categories, e.g. 5\ categories \qquad (4.4)$$

$$Interval_{Workload} = \frac{15 - 1}{5}$$

$$Interval_{Workload} = 2.8$$

Then, upper range of first category was obtained by summing lowest score with interval. For example category 1 upper range was 1+2.8 = 3.8. Next category also calculated using the same way (Formula 4.4). Table 4.18 shows workload combination category and its range.

Table 4.18 Workload Combination Category

Category	**Range**	
1	1	3.8
2	3.85	6.6
3	6.65	9.4
4	9.45	12.2
5	12.25	15

Because workload was translated into 5 categories, Hay score also translated into 5 categories. In this calculation, 294 was used as the lowest Hay score and 394 was used as the highest Hay score such as:

$$Interval_{Hay\ Score} = \frac{394 - 295}{5}$$

$$Interval_{Hay\ Score} = 19.8$$

Then, upper limit for each category become:

Category 1 = 295 + 19.8 = 318.8

Category 2 = 318.8 + 19.8 = 334.6

Category 3 = 334.6+ 19.8 = 354.4

Category 4 = 354.4+ 19.8 = 374.2

Category 5 = 374.2+ 19.8 = 394

Table 4.19 shows Hay score range after divided into 5 categories.

Table 4.19 Hay Category

Category	Range	
1	295	318.8
2	318.85	334.6
3	334.65	354.4
4	354.45	374.2
5	374.25	394

Table 4.20 shows score of workload combination and Hay score for each assessed unit, then Table 4.21 shows workload score and Hay score that already translated into 5 categories.

Table 4.20 Workload Combination Score and Hay Score

Unit	Workload Combinaton	Hay Score
Medical Record	8	295
IGD	5	394
Inpatient	4	

Table 4.21 Workload and Hay Categories

Unit	Workload Category (WC)	Hay Category (HC)
Medical Record	3	1
IGD	2	5
Inpatient	2	5

Then, weighted incentive for Medical Record unit based on workload and Hay categories was calculated depend on ratio for workload (r) and ratio for grading (100%-r) by adopting from Formula 4.2. Supposed that hospital set ratio at 20%. Then the calculation become:

$$Incentive\ Weight = r\ WC + (100\% - r)\ HC$$
$$Incentive\ Weight = 20\%\ (3) + 80\%\ (1)$$
$$Incentive\ Weight = 1.4$$

Incentive weight of 1.4 mean from category 1 to 5, Medical Record category was in the level of 1.4. Then, Formula 4.5 provide incentive calculation for Medical Record unit by considering number of unit that would receive the incentive, so the incentive available was sufficient. If hospital provide Rp 10,000,000 for incentive allocation, then the calculation become:

$$Medical\ Record\ Incentive\ = \frac{Incentive\ Weight}{Max\ Category \times Num\ of\ unit} \times Available\ Incentive \qquad (4.5)$$
$$Medical\ Record\ Incentive\ = \frac{1.4}{5 \times 3} \times Rp\ 10{,}000{,}000$$
$$Medical\ Record\ Incentive\ = Rp\ 933{,}333$$

Table 4.22 shows incentive amount received by each unit and remaining incentive if beginning incentive provided was Rp 10,000,000.

Table 4.22 Incentive Received by Each Unit

Unit	**Workload Category (WC)**	**Hay Category (HC)**	**Incentive (Rp)**
Medical Record	3	1	933,333
IGD	2	5	2,933,333
Inpatient	2	5	2,933,333
Total			6,800,000
Remaining Incentive			3,200,000

If workload category and Hay category was highest, there will be no incentive remaining such as shown in Table 4.23. Means that all money for incentive allocation was used.

Table 4.23 Highest Category's Incentive

Unit	Workload Category (WC)	Hay Category (HC)	Incentive (Rp)
Medical Record	5	5	3,333,333
IGD	5	5	3,333,333
Inpatient	5	5	3,333,333
Total			10,000,000
Remaining Incentive			0

By using this incentive system design, the lower ratio set for workload, the remaining incentive also become lower. Table 4.24 shows incentive amount received by each unit and remaining available incentive if workload ratio and grade ratio were changed but workload and hay category remain the same such as Table 4.21.

Table 4.24 Incentive Allocation by Changing Ratio Value

r	MR (Rp)	IGD (Rp)	Inpatient (Rp)	Total (Rp)	Remaining (Rp)
10%	800.000	3.133.333	3.133.333	7.066.667	2.933.333
20%	933.333	2.933.333	2.933.333	6.800.000	3.200.000
30%	1.066.667	2.733.333	2.733.333	6.533.333	3.466.667
40%	1.200.000	2.533.333	2.533.333	6.266.667	3.733.333
50%	1.333.333	2.333.333	2.333.333	6.000.000	4.000.000
60%	1.466.667	2.133.333	2.133.333	5.733.333	4.266.667
70%	1.600.000	1.933.333	1.933.333	5.466.667	4.533.333
80%	1.733.333	1.733.333	1.733.333	5.200.000	4.800.000
90%	1.866.667	1.533.333	1.533.333	4.933.333	5.066.667

4.4.2 Incentive System Design 2

The second incentive system design was developed if bonus incentive given to unit with workload combination higher than specific value. In this design, workload combination score and Hay score were not divided into categories. Instead, value per score was calculated. Table 4.25 shows which unit that required to get incentive if agreed workload combination value was higher than 5.

Table 4.25 Incentive Allocation for Units

Unit	Workload Combination	Hay Score	Bonus Incentive
Medical Record	8	295	Yes
IGD	5	394	No
Inpatient	4	394	No

Supposed hospital allocated Rp 10,000,000 for incentive purpose and use Formula 4.6 to determine incentive bonus allocation for unit or group, Formula 4.6 was adapted from Formula 4.2. This formula allows unit to get incentive for grade appreciation, workload appreciation, and additional bonus for workload excess the agreed standard. Again, ratio should be set and number of unit that going to receive the incentive should be considered.

$$I_A = I_g + I_w$$

$$I_A = I_g + (I_{bw} + B) \tag{4.6}$$

Where:

I_A = Available allocated incentive in the company

I_g = Incentive for grade appreciation

I_{bw} = Incentive for workload appreciation up to specific value

B = Bonus incentive for workload more than specific value

Similar with the first incentive system design, if 20% was chosen as ratio for workload appreciation and available incentive from hospital was Rp 10,000,000 then Rp 2,000,000 was available for workload appreciation. Value per 1 workload score was calculated such as:

$$Value\ per\ workload = \frac{Incentive\ for\ workload}{Total\ workload\ combination\ score} \tag{4.7}$$

$$Value\ per\ workload = \frac{2{,}000{,}000}{8+5+5}$$

$$Value\ per\ workload = Rp\ 111{,}111$$

After that, value per 1 grading score was calculated. Similar with the first incentive system design, if ratio for workload appreciation was 20%, then ratio for grading appreciation was 80%. If available incentive from hospital was Rp 10,000,000 then Rp 8,000,000 was available for grade appreciation.

$$Value\ per\ grading\ score = \frac{Incentive\ for\ grading}{Total\ grading\ score}$$

$$Value\ per\ grading\ score = \frac{8{,}000{,}000}{295+394+394}$$

$$Value\ per\ grading\ score = Rp\ 7{,}386$$

Table 4.26 shows total incentive obtained for each unit and remaining incentive allocation.

Table 4.26 Incentive per Unit

Unit	GS	WS	WSb	A (Rp)	B (Rp)	C (Rp)	Total Incentive (Rp)
MR	295	8	3	2,178,870	555,555	334,296	3,068,721
IGD	394	5	0	2,910,084	555,555	0	3,465,639
Inpatient	394	4	0	2,910,084	555,555	0	3,465,639
TOTAL (Rp)				7,999,038	1,666,665	334,297	9,999,999
Remaining (Rp)				962	333,335	1	1

Where:

GS = Grading Score

WS = Workload Score

WSb = Workload score deviation between actual and agreed workload combination limit (because bonus incentive was given for workload more than 5, then WSb=WS-5)

A = Incentive for grade appreciation

B = Incentive for workload appreciation up to specific value

C = Bonus incentive

Here are example calculation for Medical Record unit (MR) incentive allocation:

$$A = GS \times Value\ per\ grading\ score \tag{4.8}$$

$$A = 295 \times Rp\ 7{,}386$$

$$A = Rp\ 2{,}178{,}870$$

$$B = Specific\ Value \times Value\ per\ workload\ score$$

$$B = 5 \times Rp\ 117{,}647$$

$$B = Rp\ 588{,}235$$

Bonus incentive (C) was calculated after obtaining remaining incentive available and allocated it to unit depend on how much their excess workload.

$$Remaining\ incentive = Incentive\ Available - Total\ A - Total\ B$$

$$Remaining\ incentive = 10{,}000{,}000 - 7{,}999{,}038 - 1{,}666{,}665$$

$$Remaining\ incentive = Rp\ 334{,}297$$

Calculate value per 1 exceed workload.

$$Value\ per\ exceed\ workload = \frac{Remaining\ incentive}{Total\ WSb}$$

$$Value\ per\ exceed\ workload = \frac{Rp\ 334{,}297}{3 + 0 + 0}$$

$$Value\ per\ exceed\ workload = \ Rp\ 111{,}432$$

Then, bonus incentive for Medical Record unit when their workload combination (WSb) was 1 level higher than specific/agreed workload value become:

$$C\ = WSb \times Value\ per\ exceed\ workload$$

$$C\ = 3 \times\ Rp\ 111{,}432$$

$$C\ = Rp\ 334{,}296$$

Table 4.27 shows simulation of incentive allocation for each unit if ratio for workload appreciation (r) were changed. Then, table 4.28 shows simulation if agreed workload limit (specific value) was changed when using workload ratio (r) 20%. Table 4.29 shows simulation by combining ratio changing and workload limit (SV) changing.

Table 4.27 Total Incentive Allocation by Changing Ratio Value

r	MR (Rp)	IGD (Rp)	Inpatient (Rp)	Total (Rp)	Remaining (Rp)
90%	4,272,675	2,863,662	2,863,662	9,999,999	1
80%	4,100,911	2,949,544	2,949,544	9,999,999	1
70%	3,928,359	3,035,820	3,035,820	9,999,999	1
60%	3,756,585	3,121,707	3,121,707	9,999,999	1
50%	3,584,821	3,207,589	3,207,589	9,999,999	1
40%	3,412,259	3,293,870	3,293,870	9,999,999	1
30%	3,240,495	3,379,752	3,379,752	9,999,999	1
20%	3,068,721	3,465,639	3,465,639	9,999,999	1
10%	2,896,169	3,551,915	3,551,915	9,999,999	1

Table 4.28 Total Incentive Allocation by Changing Agreed Workload Limit

Agreed Workload Limit	MR (Rp)	IGD (Rp)	Inpatient (Rp)	Total (Rp)	Remaining (Rp)
2	3,120,568	3,498,580	3,380,846	9,999,994	6
3	3,120,646	3,498,559	3,380,792	9,999,997	3
4	3,120,814	3,498,511	3,380,672	9,999,997	3
5	3,068,721	3,465,639	3,465,639	9,999,999	1
6	2,979,832	3,510,084	3,510,084	10,000,000	-
7	2,907,106	3,546,447	3,546,447	10,000,000	-
8	2,845,534	3,576,748	3,576,748	9,999,030	970

Table 4.29 Total Incentive Allocation by Changing Ratio and Agreed Workload Limit

r	SV	MR (Rp)	IGD (Rp)	Inpatient (Rp)	Total (Rp)	Remaining (Rp)
20%	3	3,120,646	3,498,559	3,380,792	9,999,997	3
50%	3	3,715,206	3,289,509	2,995,282	9,999,997	3
80%	3	4,309,764	3,080,460	2,609,774	9,999,998	2
20%	5	3,068,721	3,465,639	3,465,639	9,999,999	1
50%	5	3,584,821	3,207,589	3,207,589	9,999,999	1
80%	5	4,100,911	2,949,544	2,949,544	9,999,999	1
20%	8	2,845,534	3,576,748	3,576,748	9,999,030	970
50%	8	3,028,384	3,485,368	3,485,368	9,999,120	880
80%	8	3,211,234	3,393,988	3,393,988	9,999,210	790

CHAPTER 5
DATA ANALYSIS AND INTERPRETATION

This chapter discusses about data processing result and analysis from previous chapter.

5.1 Analysis and Interpretation of Workload Calculation

This sub chapter analyzed and interpreted workload calculation from Chapter 4. Workload assessment divided into objective assessment and subjective assessment. After that, both assessment results were compared.

5.1.1 Objective Assessment

Based on objective assessment using SNI 7269:2009 in Table 4.3, Table 4.4, and Table 4.5, it can be seen that Medical Record Unit has the highest physical workload followed by IGD and Inpatient Unit. However, it was still in the medium category because most activity was categorized as light or medium workload. Whereas both IGD and Inpatient units were in the light category. This may happen because there was no emergency situation while observation was done, so nurse in IGD and Inpatient only done several administration activity or regular patient care such as infuse changing that did not require much effort. Then, from total 8 work hours or 480 minutes, IGD nurse only worked for 171 minutes and Inpatient nurse 182 minutes. On the other hand, Medical Record unit worked 491 minutes, means there were 11 minutes extra work. This condition was appropriate with interview with manager and Medical Record employees that usually they worked over normal working hours whether it worked early at 6 A.M. or finished latest at 5 P.M. or skipping break hour.

In Table 4.3, most activity done by Medical Record employee were arranging files and pushing file cart. Arranging file was an activity where employee move medical record's file to other place, piling it up, and sorting files according to medical record number before put it back to shelf. About 30% total work hours were used to di this activity. The second activity was pushing file cart to medical

service units. Around 25% work hours were used to do this activity, but SNI method did not consider about weight in the cart, so the physical workload using this method may not as accurate as desired. Still, pushing file cart was considered as heavy activity since the workload value was 6.25 kcal which was exceed standard normal energy consumption (5 kcal for male and 4 kcal for female). Arranging file was not exceed standard normal energy consumption for male, but it was for female.

Another evaluation that can be seen in this calculation was consideration for additional employees due to the amount of time required for arranging files and pushing file cart. Arranging files usually required much time due to number of patient used RSPKT's medical service which impact to number of medical record files that should be processed. The more number of medical records should be processed, the more time needed. Additional employee for this job may able to decrease time needed to finish the task. Automation or more prepared form also recommended, for example use sticker instead of writing patient's biodata in the form. Whereas, pushing cart required much time due to long distance between Medical Record unit to other medical service units. Improvement recommendation for this distribution job for example adding more employees, re-layouting, or automation.

Workload result based on this method, even though there were activities that can be captured, cannot capture mental effort that caused several employees felt exhausted even though they were done less heavy activities. Objective assessment that focused on mental workload seems preferable for this kind of job.

After knowing the calory consumption in physical workload, resting time can be calculated by considering average calory consumption per minute, time, gender, body mass, and age. Average calory consumption was used to determine how much energy exceed the standard energy expenditure, the more deviation between actual and standard, the more time required for resting. Working time also influence how much time required for resting, more working time means more resting time. Gender and body mass was used to determine basal metabolism and standard energy expenditure. Age was used for additional time allowance. Resting time calculation result in Chapter 4 was 16.66 minutes, means that from total 490.97 minutes of work, female employee should take 16.66 minutes rest. It is better to

take resting time while physical workload was highest such as after finished arranging files or after finished pushing cart.

5.1.2 Subjective Assessment

From NASA-TLX questionnaires, it can be seen in Table 4.6, Table 4.7, and Table 4.8 that the workload in RSPKT units was in the range of high and very high. This subjective assessment also able to capture physical workload in employees' point of view and most job said that Physical Demand was not required much. Most Medical Record employees choose Temporal Demand as the most influence factor in causing mental stress because Temporal Demand was related with time pressure or deadline. Meanwhile, nurses in IGD and Inpatient unit choose Mental Demand as the most influence factor in causing mental stress because Mental Demand was related with concentration requirement for the job. Own Performance (OP) or the unsatisfied feel while finishing the task also high due to complexity of patient's disease. Frustration (FR) was low because there were no social conflict between co-workers. Effort (EF) was moderate due to the activity that quiet repetitive, so employee needn't much effort in conducting the task (they already used to).

5.2 Analysis and Interpretation of Job Evaluation

Hay Job Evaluation provide score to determine in which position where the jobs in the organization. From Table 4.11 it can be seen that Medical Record score was 295 and from Table 4.12 it can be seen that nurse score was 394. By looking at Table 2.7, both of them were considered as staff. However, nurse has higher score due to knowledge requirement, risk, and effort that have more important impact to the customers (patients). Even though from objective assessment (observation) nurses workload were low due to non-emergency situation, they should always ready 24 hours. Means that there is always probability for unexpected situation that may force them to work overload.

In checking Hay score validation, Kurnia (2014) and Susilo (2015) used sore thumbing by looking at Hay factor score result. The Hay score result was appropriate if Know-How factor score was the highest among other factors such as Problem Solving, Accountability, and Working Condition. On the other hand, Murhanindyo (2013) used highlighted template such as Appendix 4. If intersection fell on "most likely" cell, it means that the score was appropriate.

5.3 Analysis and Interpretation of Incentive System Design

Incentive system design in this research was developed in order to appreciate actual workload issue in the remuneration system. There were two plans which were including the workload into grading system or additional incentive given to unit which work over the specific workload combination value.

5.3.1 Incentive System Design 1

The first result at Table 4.22 shown that Medical Record cannot receive incentive more than IGD and Inpatient units even though their workload combination was higher. This was happen due to categorization and the Hay score value difference between Nurse and Medical Record employee. Nurse's score was 99 higher than Medical Record employee. It also influenced by the ratio set for each workload and grade/Hay category. If ratio set for workload was high, the difference incentive amount received by Nurse and Medical Record Employee became low. It could be seen through Table 4.24 by comparing Medical Record incentive (MR) with IGD or Inpatient incentive. From Table 4.24 also, Medical Record was able to receive more than IGD and Inpatient if ratio was set to 90%.

Then, in this incentive design, the incentive available will always remain except all unit works at maximum workload category and they are in the highest grading category (see Table 4.23). From Table 4.24, it could be seen that the remaining available incentive was increasing. Then, it could say that remaining amount incentive was related with workload ratio. If ratio for workload was high but the actual workload was remain low, there will be unused incentive allocation for workload. Unused incentive allocation was also came from grading category because it was impossible for every unit to have maximum grading category. At

last, this incentive system design already consider a little about workload with the drawback of large amount of remaining incentive. A better adjusted category or developing standard determination may lead to better approach.

5.3.2 Incentive System Design 2

In this incentive system design, standard workload was determined to appreciate unit which workload combination higher than standard. The calculation set 5 as standard workload combination, thus the unit with workload combination more than 5 would receive bonus while unit with workload combination up to 5 still receive incentive. From result in Table 4.26, there are no remaining incentive because bonus incentive (C) was obtained after calculate base incentive for grading appreciation (A) and base incentive for workload appreciation (B). Again in this incentive system design, Medical Record couldn't receive more than IGD or Inpatient because IGD and Inpatient have higher grading/Hay score (GS).

From simulation in Table 4.27 if ratio between workload (r) and grading (100%-r) were changing, Medical Record could receive more if workload ratio was high. It could be seen that in r value between 90% until 40%, Medical Record could receive more than Inpatient unit even though Inpatient unit has higher Hay score value. This is happen because Medical Record receive bonus (C) while Inpatient didn't receive any bonus.

Incentive amount also depend by agreed workload limit. From Table 4.28 it could be seen that incentive received by IGD and Inpatient units was increasing from 2 until 5 then started to decrease at 6 until 8. This was happen because from actual workload combination, the minimum workload was 5. The incentive allocation for grade appreciation (A) was not change, but incentive allocation for workload (B) was change. This condition impact the incentive allocation for bonus (C). If agreed workload limit was low, base incentive for workload (B) became low but bonus (C) became high. Then, if standard workload was set at 8, all units didn't receive any bonus (C). They only receive grade incentive (A) and workload incentive (B). The plan was set to appreciate even though the unit worked below standard, thus the total workload combination score should more than standard workload combination multiplied by number of unit. Appreciating low workload

were not recommended because it would be not fair for unit who always has high workload.

This research was also done simulation for combination changing between ratio and agreed standard workload at Table 4.29. The incentive amount was vary, but higher ratio for workload and lower agreed standard would increase incentive amount received by unit which workload above agreed standard. Thus the best choice was set workload ratio below 40% so unit which required high qualification (represent by Hay score) still receive more and workload limit below 4 was chosen so all units able to receive bonus.

Appendix 1. Workload Estimation based on Energy Consumption (SNI 7269:2009)

No	Activity		Body Position			
			1	2	3	4
			Sit (0,3)	Stand (0,6)	Walk (3,0)	Climb (3,8)
1	Activity using hand					
	Category I (e.g.: writing)	(0,30)	0,60	0,9	3,30	4,10
	Category II (e.g.: ironing)	(0,70)	1,00	1,30	3,70	4,50
	Category III (e.g.: typing)	(1,10)	1,40	1,70	4,10	4,90
2	Activity using one arm					
	Category I (e.g.: sweeping)	(0,90)	1,20	1,50	3,90	4,70
	Category II (e.g.: saw off)	(1,60)	1,90	2,20	4,60	5,40
	Category III (e.g.: nail)	(2,30)	2,60	2,90	5,30	6,10
3	Activity using two arms					
	Category I (e.g.: patching, arranging items inside box)	(1,25)	1,55	1,85	4,25	5,05
	Category II (e.g.: pumping, forging)	(2,25)	2,55	2,85	5,25	6,05
	Category III (e.g.: pushing a cart)	(3,25)	3,55	3,85	6,25	7,05
4	Activity with body movement					
	Category I (e.g.: administration)	(3,75)	4,05	4,35	6,75	7,55
	Category II (e.g.: brush off a carpet, swab)	(8,75)	9,05	9,35	11,75	12,55
	Category III (e.g.: digging, chop a tree)	(13,75)	14,05	14,35	16,75	17,55

Explanation:

Working activity : Activity category + body position

Example: Category 1.1 activity using hand with sitting position, thus working activity = (0,3) + (0,3) = 0,6

Appendix 2. Questionnaire Design

PENDAHULUAN

Perkenalkan saya Selma Farista dari Jurusan Teknik Industri Institut Teknologi Sepuluh Nopember yang tengah mengerjakan Tugas Akhir sebagai syarat perolehan gelar Sarjana Teknik (S-1). Topik penelitian saya yakni mengenai evaluasi beban kerja karyawan untuk menyusun sistem insentif dalam rangka meningkatkan motivasi kerja.

LATAR BELAKANG

Sumber Daya Manusia (SDM) merupakan aset penting sebagai pilar penggerak roda organisasi dalam upaya mewujudkan visi dan misi. Keberhasilan perusahaan dalam mencapai tujuan sangat bergantung pada kemampuan SDM dalam menjalankan tugas-tugas yang diberikan. Oleh karena itu perusahaan harus menciptakan suasana yang dapat memotivasi karyawan untuk meningkatkan prestasi kerja. Seberapa baik prestasi kerja seorang karyawan dapat dilihat melalui penilaian kinerja. Melalui penilaian kinerja pula perusahaan dapat melakukan perbaikan prestasi kerja, penyesuaian kompensasi, insentif, serta membuat keputusan penempatan, perencanaan, dan pengembangan karir.

Penelitian ini berfokus pada penilaian kerja yang disesuaikan dengan beban fisik dan mental karyawan untuk kemudian dijadikan pertimbangan dalam pemberian insentif. Sebelum melakukan observasi lebih lanjut, ada baiknya dilakukan survei untuk mengetahui adanya keluhan beban kerja, motivasi, serta pandangan mengenai sistem insentif pada objek amatan. Survei berupa kuesioner ini terbagi menjadi 3 bagian yang bertujuan untuk mengetahui adanya keluhan beban kerja secara umum, indikasi beban mental, serta identifikasi kelelahan.

BIODATA PENGISI KUESIONER

Biodata pengisi kuesioner (responden) akan digunakan sebagai validitas dan kebutuhan data perhitungan beban kerja fisik.

Nama :

Usia : … tahun

Jenis Kelamin : L/P (hapus/coret salah satu)

Berat Badan :

Masa Kerja : … tahun

Pendidikan Terakhir :

Status Kepegawaian : Tetap/Kontrak (hapus/coret salah satu)

Jabatan/Posisi :

KUISIONER I: KELUHAN BEBAN KERJA SECARA UMUM

1. Bagaimanakah perasaan Anda terhadap pekerjaan yang Anda lakukan sekarang?

   a. Tidak suka b. Biasa saja c. Suka d. Sangat suka

   alasan (mohon diisi) …….

2. Selama bekerja, hal apakah yang paling memotivasi Anda?

   a. Gaji c. Penghargaan e. Lainnya (isi sendiri) ……..

   b. Fasilitas d. Rekan Kerja

3. Apakah Anda merasa beban pekerjaan saat ini sesuai dengan dekripsi kerja yang diberikan?

   a. Ya b. Tidak

4. (Bila menjawab **tidak** pada pertanyaan No. 3) Alasannya…….

5. Apakah Anda merasa gaji yang diberikan sesuai dengan beban kerja yang Anda terima?

   a. Sesuai b. Kurang sesuai

6. Apakah Anda setuju dengan pemberian insentif (bonus) sesuai dengan performansi kerja per individu?

   a. Ya b. Tidak

   alasan (mohon diisi) …….

KUESIONER II: INDIKASI BEBAN MENTAL

1. Berikan rating dengan skala 0 hingga 100 pada masing-masing indikator beban mental di bawah ini selama melaksanakan pekerjaan sesuai subjektivitas Anda

Kode	Indikator Beban Mental	Keterangan	Rating
MD	*Mental Demand*	Seberapa besar aktivitas mental, persepsi, dan konsentrasi yang dibutuhkan (misal: berpikir, memutuskan, menghitung, mengingat, melihat, mencari, dll).	
PD	*Physical Demand*	Jumlah aktivitas fisik yang dibutuhkan (misal: mendorong, menarik, memutar, dll)	
TD	*Temporal Demand*	Seberapa besar tekanan yang dirasakan terhadap waktu selama melaksanakan perkerjaan (misal: longgar/santai atau sibuk)	
OP	*Performance*	Seberapa besar keberhasilan dan kepuasan yang Anda rasakan dalam menyelesaikan pekerjaan	
FR	*Frustation Level*	Tingkat rasa tidak aman, putus asa, atau tersinggung ketika melaksanakan pekerjaan	
EF	*Effort*	Seberapa keras usaha mental dan fisik yang dibutuhkan untuk menyelesaikan pekerjaan sesuai dekripsi kerja yang telah ditetapkan	

0~100 = rendah~tinggi

2. Pilihlah satu dari tiap pasangan kategori ini yang menurut anda lebih signifikan atau dominan menjadi sumber beban mental (contoh: pekerjaan lebih membutuhkan usaha fisik daripada mental, maka PD lebih dominan daripada MD, PD/~~MD~~)

1. PD/MD	6. TD/PD	11. TD/FR
2. TD/MD	7. OP/PD	12. TD/EF
3. OP/MD	8. FR/PD	13. OP/FR
4. FR/MD	9. EF/PD	14. OP/EF
5. EF/MD	10. TD/OP	15. EF/FR

KUESIONER III: KELUHAN KELELAHAN

Tabel di bawah merupakan 30 indikasi kelelahan oleh *Reseacrh Committee on Industrial Fatigue of Japan Society for Occupational Health (1969)* yang mungkin dirasakan selama bekerja.

Isilah kolom kosong dalam tabel dengan menuliskan angka 1-4 sesuai tingkat frekuensi terjadinya gejala.

1: Tidak Pernah 3: Sering

2: Jarang 4: Selalu

	Kepala terasa berat		Sering lupa
	Rasa lelah di seluruh tubuh		Kurang percaya diri
	Kaki terasa lelah		Merasa cemas/tidak aman
	Sering menguap		Tidak bisa menjaga sikap tubuh
	Kepala terasa panas atau pikiran kacau		Merasa tidak sabar
	Sering mengantuk		Sakit kepala
	Mata terasa tegang		Merasa pegal di pundak
	Badan terasa kaku ketika bergerak		Merasa pegal di punggung
	Merasa tidak seimbang ketika berdiri		Sulit bernapas
	Ingin berbaring		Merasa haus
	Sulit berpikir		Suara serak
	Berbicara terbata-bata		Kepala terasa pusing dan berputar
	Merasa gelisah/gugup		Terdapat kantung mata
	Sulit berkonsentrasi		Ada anggota tubuh yang gemetaran
	Merasa tidak termotivasi		Merasa sakit/tidak sehat

Indikasi kelelahan di atas biasanya terjadi pada rentang waktu pukul … hingga ...

Keluhan lainnya (isi sendiri): ……

PENUTUP

Atas waktu dan perhatian Anda dalam mengisi kuesioner ini, saya ucapkan terima kasih. Semoga hasil penelitian ini dapat memberi manfaat bagi Anda, perusahaan, serta saya sendiri.

Appendix 3. Job Evaluation Guide Using Hay Method

Factor	Definition
KNOW-HOW	All knowledge and skill developed by the result of working experience and training. It is needed by a person to finish the task.
Technical Know-How	All requirements for practical prochedure, technical specialization, and scientific discipline. This type of skill and knowledge has characteristic based on breadth of knowledge type and depth of mastery.
Management Knowledge	Related with job requirement for planning, organizing, managing and developing activity, and operating organization. Also it used "management" terms in common understanding because all jobs need several forms of "management" skill.
Human Relation Skill	Related with positive requirement measurement in the job for working with (and through) other people in achieving desired final result.
PROBLEM SOLVING	Self thinking that is required for job in analyzing, evaluating, creating, reasoning, and drawing conclusion. In a condition where thinking is limited by standard or covered by authority or other person, the problem solving value will be decreased.
Thinking Environtment	Related with level of clue in problem approaching. It measured by observing whether there are obstacles or not which influence the way of solving the problem, also limited by direct supervision or personal control which guide the job holder in conduct problem approaching.
Analytical Challenge	Related with creative thinking which is needed to solve the problem. This factor assess the complexity of problem and how far it related to experience.
ACCOUNTABILITY	Related with opportunity where a job should generate spesific result and importance level for organization, also responsibility level of job holder towards the job result.
Freedom to Act	Related with fundamental characteristic measurement of controls which limiting or lengthen the problem solving track or influencing

Factor	Definition
	the job. This factor is measured based on existence of peronal control or prochedure.
Impact	Related with how far the job can influence or give desired result in spesific unit or function.
Magnitude	Related with effect of job result towards unit or function measurement (usually expressed as Rupiah per year)
WORKING CONDITION	Measure unavoidable condition in doing the job.
Physical Effort	Related with physical activity level in various intensity, duration, and frequency which can cause physical fatigue and stress.
Mental Stress	Related with level of various factors with various intensity in working process or environtment which can cause mental strain and stress.
Sensory Attention	Related with concentration level from human's five senses which are used in doing the job.
Physical Environment	Related with degree of receiving physical and environmental factors (from various intensity) which can't be avoided, thus can increase the risk of disease, accident, or injury.

KNOW-HOW : TECHNICAL KNOW-HOW

Level		Definition
A	**Basic**	This job needs a little introduction and training in the workplace.
B	**Elementary**	This job needs socialization/introduction, simple standard working prochedure and/or equipment/machine usage.
C	**Vocational**	This job needs knowledge about prochedure or system which may involve spesific equipment usage (or the way to use the equipment).
D	**Advanced Vocational**	This job needs authoritative or practical knowledge method and prochedure is obtained from extensive working experience or through formal training which leads to professional classification part. This job needs authoritative comprehension method, system and process, but don't need conceptual comprehension to fundamentally create or change them.

Level		Definition
E	**Specialized**	This job needs practical and theoretical knowledge, and ability to work beyond problem or compose new approach from basic principles. Usually this level is associated with professional qualification or academic or obtained through detailed comprehension about associated practice and broad procedure and/or practical experience.
F	**Seasoned**	This job needs autonomy in technical field, science, or spesific which is obtained through broad and deep experience which is established from concepts and principles, or through broad explanation for complex practice and precedent.
G	**Specialized Mastery**	This job needs mastery to determine concept, principle, and practice which is obtained through deep development in very spesific field or through broad experience and authoritative order in the operation and function.
H	**Profesional Mastery**	This job needs complex scientific knowledge and externally recognized also various disciplines that has been learned.

KNOW-HOW : MANAGEMENT KNOWLEDGE

Level		Definition
N	**None**	Task implementation, very specific in terms of goal and content and don't involve any leadership from others
I	**Minimal**	Implementation or briefing of activities that have similar goal and content with enough awareness towards other activity
II	**Related**	Briefing to a unit with various activities and goals **or** give direction to sub functions or several important elements in several organization units
III	**Diverse**	Briefing to big unit with several functionals **or** give direction to functions that influence all or major organization
IV	**Broad**	Briefing from bigger unit with various substantial functions **or** give direction to a strategic function which influence planning and operation of organization
V	**Total**	Manager from all units or functions in an organization

KNOW-HOW : HUMAN RELATION SKILL

Level		Definition
1	**Basic**	This level is a fundamental level of interpersonal skill that is be used with most individu in carry out their duty. This involve ability to communicate with simple courtesy and effectiveness in human relation.
2	**Important**	Need ability to understand, influence, empathy, and communicate with other people, and this ability is an important thing in achieving job's goal.
3	**Critical**	Need ability to influence, develop, and change motivation and behavior of person regularly, and this ability is very important to achieve goal.

PROBLEM SOLVING : THINKING ENVIRONMENT

Level		Definition
A	**Highly Structured**	Thinking in detailed rule, and/or rigid instruction and/or supervision (by people or system). Steps in decision action is already assigened.
B	**Routine**	Thinking in standard direction and/or strict supervision continously (by people or system). Most action steps are already defined.
C	**Semi-routine**	Thinking in well defined prochedure and various precedents, and/or routine supervision. Detailed action is not defined but there is only approach.
D	**Standardized**	Thinking in diversified substantial, established prochedure and standard, and general supervision. Most problem or case can be solved based on experience, but for the most complex problem would needs suggestion.
E	**Clearly Defined**	Thinking in a clear policy, spesific principles and goals, under direction which is provided from senior manager.
F	**Generally Defined**	Thinking in broad functional policy and goal and under general direction only.
G	**Broadly Defined**	Thinking about general policies, principles and goals under guidance.
H	**Abstract**	Thinking about business philosophy or rules and principles which arranging human affair.

PROBLEM SOLVING : ANALYTICAL CHALLENGE

Level		Definition
1	**Repetitive**	Similar situations which require solution with simple option from things that have been learned.
2	**Patterened**	Similar situation that requires solution by distinguish options between things that have been learned.
3	**Interpolative**	Different situation which requires solution identification and election through implementation of obtained knowledge.
4	**Adaptive**	Situation that requires analytical thinking, interpretative, evaluative, and/or constructive and significant evaluative assessment level.
5	**Uncharted**	Pathfinding situation (where the problem is how to find the best way from starting point to final destination by avoiding various obstacles) that requires creative thinking, new concepts development and an approach which significantly contribute towards knowledge and thinking imprvement.

ACCOUNTABILITY : FREEDOM TO ACT

Level	Definition
A	This job obeys direct and detailed instruction **and or** constant supervision by individual or system.
B	This job obeys direct and detailed instruction **and or** very strict supervision.
C	This job obeys existing instruction and work routine **and or** very strict supervision.
D	This job obeys (whole or partly) standardized practice and prochedure, general working instruction and supervision over development and work result
E	This job obeys (whole or partly) practice and prochedure which included in precedent or defined policy and supervision review.
F	This job (based on characteristic and size) obeys wider practice and prochedure, and included in precedent and functional policy, achievement of limited operational activity and manager supervision.
G	This job (based on characteristic and size) obeys wider functional policies and goals, and natural characteristic from manager supervision.
H	This job obeys organization's policy guidance in general, limitations from legislative group and credential from orgnization.

ACCOUNTABILITY : IMPACT

Level		Definition
A	**Ancillary**	One or several positions that contribute towards desired final result from a unit or function; **or** give information, recording or facilitate a service to be used for other people in achieving final result.
C	**Contributory**	One or several positions that contribute significantly towards desired final result from a unit or function; **or** interpretation, suggestion or another support service which is important to be used by other functions in achieving final result.
S	**Shared**	Controlling in balance and together (with one ore more positions) in several activities and resources which produce final result **or** clearly controlling towards almost all variables which significantly determine final result.
P	**Primary**	Controlling the impact where this position has effective control towards significant activities and resources which produce final result, and become the only position that should give answer towards final result.

ACCOUNTABILITY : MAGNITUDE

Level		Definition
M	**until 10 Million**	The result usually infulences individual or non quantitative in terms of department's budget responsibility, income and expenditure authority.
1	**10 - 100 Million**	The result can be non quantitative or able to influence unit or small team work in a department.
2	**100 Million - 1 Billion**	The result is internally focused and influence several units in a department or may be externally focused and influence customers (clients) from outside department in limited amount.
3	**1 - 10 Billion**	The result is internally focused and influence several units in a department and/or several departments and/or externally focused which influence customers (clients) which is significant in a program or functional area.
4	**10 - 100 Billion**	The result is specifically influence the whole department and may have several impacts to other departments and/or externally focused which influence customers (clients) extensively in a program or functional area.
5	**>100 Billion**	Obtained result is specifically influence departments, overall government and external client party which is significant to the gorvernment.

WORKING CONDITION : PHYSICAL EFFORT

Level		Definition
A	**Minimal**	Require stand and sit position in doing work activity, in a comfort indoor location, in a long time. There are lifting movement or carrying lightweight object.
B	**Moderate**	Require stand or walk position in doing work activity and sometimes doing less comfortable work position. There use lightweight or moderatewight object.
C	**Substansial**	Doing several heavy physical activities. Physical ability is required to lift, pull or doing similar physical activity, and those physical activities sometimes are done in awkward position or in limited space, thus need more effort.
D	**Extreme**	Doing very heavy physical activity in various forms almost at the same time (eg. Climbing while carrying heavy object in an awkward position). This job usually is done in a difficult place and very uncomfortable.

WORKING CONDITION : PHYSICAL ENVIRONMENT

Level		Definition
A	**Minimal**	Working environment usually quite comfortable with a bit of dust exposure, dirt or other condition that can reduce comfort, and low risk of work accident or disease.
B	**Moderate**	Working environment may cause uncomfortable situation or has moderate risk in causing work accident or disease.
C	**Substansial**	Working environment very uncomfortable and has high risk in causing work accident or disease.
D	**Extreme**	Working environment related with hazardous materials or equipments or working situation has an extreme risk in causing work accident or disease.

WORKING CONDITION : SENSORY ATTENTION

Level		Definition
A	**Minimal**	Very limited or not required concentration in using human senses. Generally, used human senses are normal vision and hearing with a bit of focus on certain factors in working environment.
B	**Moderate**	There are moderate necessity in the use of human senses. There is certain time/factor in working environment which needs concentration while using one or more human senses periodically, but the requirement is not much.
C	**Substansial**	Require large human senses usage. There is certain necessity to use at least two human senses and coordinate it with other human senses.
D	**Extreme**	There is extreme necessity to concentrate while using two or more human senses, with high coordination. There is larger necessity to silmutaneously focus at certain time.

WORKING CONDITION : MENTAL STRESS

Level		Definition
A	**Minimal**	Very few linkages with several factors which able to cause mental stress. This job tends to recur. There is a few social contact or less comfortable situation, and a few pressure in terms of deadline, quota and accuracy.
B	**Moderate**	There are certain conditions in working environment which can cause moderate mental stress. Stress level won't disturb the work and that uncomfortable reaction won't last long. Job can be very repetitive, there are certain pressures which are caused by several priorities. Very possible for uncomfortable situation happen which is caused by direct contact with co-workers or superior. There is a bit problem in family or social life.
C	**Substansial**	Heavy mental pressure may happen as a result from a troubling situation or incidents that are related with probability (not certain). There is moderate problem in family or social life.
D	**Extreme**	Extreme mental pressure is a part of the job. Usually occurs very disturbing emotial situation, there are critics from public, confrontation, related with dagerous situation to oneself or other people, there are conflicts in priority or need, and probability of very oppressed situation which can cause serious impact.

Appendix 4. Hay Guide Chart

KNOW-HOW GUIDE CHART

				MANAGEMENT KNOWLEDGE																	
				N. None			I. Minimal			II. Related			III. Diverse			IV. Broad			V. Total		
			HUMAN RELATION SKILL	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
SCIENTIFIC DISCIPLINE	SPECIALIZED TECHNIQUES	PRACTICAL PROCHEDURES	A	38 43 50	43 50 57	50 57 66	50 57 66	57 66 76	66 76 87	66 76 87	76 87 100	87 100 115	87 100 115	100 115 132	115 132 152	115 132 152	132 152 175	152 175 200	152 175 200	175 200 230	200 230 264
			B	50 57 66	57 66 76	66 76 87	66 76 87	76 87 100	87 100 115	87 100 115	100 115 132	115 132 152	115 132 152	132 152 175	152 175 200	152 175 200	175 200 230	200 230 264	200 230 264	230 264 304	264 304 350
			C	66 76 87	76 87 100	87 100 115	87 100 115	100 115 132	115 132 152	115 132 152	132 152 175	152 175 200	152 175 200	175 200 230	200 230 264	200 230 264	230 264 304	264 304 350	264 304 350	304 350 400	350 400 460
			D	87 100 115	100 115 132	115 132 152	115 132 152	132 152 175	152 175 200	152 175 200	175 200 230	200 230 264	200 230 264	230 264 304	264 304 350	264 304 350	304 350 400	350 400 460	350 400 460	400 460 528	460 528 608
			E	115 132 152	132 152 175	152 175 200	152 175 200	175 200 230	200 230 264	200 230 264	230 264 304	264 304 350	264 304 350	304 350 400	350 400 460	350 400 460	400 460 528	460 528 608	460 528 608	528 608 700	608 700 800
			F	152 175 200	175 200 230	200 230 264	200 230 264	230 264 304	264 304 350	264 304 350	304 350 400	350 400 460	350 400 460	400 460 528	460 528 608	460 528 608	528 608 700	608 700 800	608 700 800	700 800 920	800 920 1056
			G	200 230 264	230 264 304	264 304 350	264 304 350	304 350 400	350 400 460	350 400 460	400 460 528	460 528 608	460 528 608	528 608 700	608 700 800	608 700 800	700 800 920	800 920 1056	800 920 1056	920 1056 1216	1056 1216 1400
			H	264 304 350	304 350 400	350 400 460	350 400 460	400 460 528	460 528 608	460 528 608	528 608 700	608 700 800	608 700 800	700 800 920	800 920 1056	800 920 1056	920 1056 1216	1056 1216 1400	1056 1216 1400	1216 1400 1600	1400 1600 1840
TECHNICAL KNOW HOW																					

LESS LIKELY MOST LIKELY

PROBLEM SOLVING GUIDE CHART

		ANALYTICAL CHALLENGE									
		1. REPETITIVE		2. PATTERNED		3. INTERPOLATIVE		4. ADAPTIVE		5.UNCHARTERED	
THINKING ENVIRONMENT	A. HIGHLY STRUCTURED	10%	12%	14%	16%	19%	22%	25%	29%	33%	38%
	B.ROUTINE	12%	14%	16%	19%	22%	25%	29%	33%	38%	43%
	C. SEMI-ROUTINE	14%	16%	19%	22%	25%	29%	33%	38%	43%	50%
	D. STANDARDIZED	16%	19%	22%	25%	29%	33%	38%	43%	50%	57%
	E. CLEARLY DEFINED	19%	22%	25%	29%	33%	38%	43%	50%	57%	66%
	F. GENERALLY DEFINED	22%	25%	29%	33%	38%	43%	50%	57%	66%	76%
	G. BROADLY DEFINED	25%	29%	33%	38%	43%	50%	57%	66%	76%	87%
	H. ABSTRACT	29%	33%	38%	43%	50%	57%	66%	76%	87%	

LESS LIKELY MOST LIKELY

% PS	TO FIND PROBLEM SOLVING POINTS, READ OFF WHERE KNOW-HOW SCORE AND PROBLEM SOLVING% INTERSECT																													% PS
	KNOW-HOW POINTS																													
	38	**43**	**50**	**57**	**66**	**76**	**87**	**100**	**115**	**132**	**152**	**175**	**200**	**230**	**264**	**304**	**350**	**400**	**460**	**528**	**608**	**700**	**800**	**920**	**1056**	**1216**	**1400**	**1600**	**1840**	**2112**	
87%	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460	528	608	700	800	920	1056	1216	1400	1600	1840	**87%**
76%	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460	528	608	700	800	920	1056	1216	1400	1600	**76%**
66%	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460	528	608	700	800	920	1056	1216	1400	**66%**
57%	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460	528	608	700	800	920	1056	1216	**57%**
50%	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460	528	608	700	800	920	1056	**50%**
43%	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460	528	608	700	800	920	**43%**
38%	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460	528	608	700	800	**38%**
33%	12	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460	528	608	700	**33%**
29%	10	12	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460	528	608	**29%**
25%	9	10	12	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460	528	**25%**
22%	8	9	10	12	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	460	**22%**
19%	7	8	9	10	12	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	400	**19%**
16%	6	7	8	9	10	12	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	350	**16%**
14%	5	6	7	8	9	10	12	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	304	**14%**
12%	4	5	6	7	8	9	10	12	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	264	**12%**
10%	3	4	5	6	7	8	9	10	12	14	16	19	22	25	29	33	38	43	50	57	66	76	87	100	115	132	152	175	200	230	**10%**
	38	**43**	**50**	**57**	**66**	**76**	**87**	**100**	**115**	**132**	**152**	**175**	**200**	**230**	**264**	**304**	**350**	**400**	**460**	**528**	**608**	**700**	**800**	**920**	**1056**	**1216**	**1400**	**1600**	**1840**	**2112**	

ACCOUNTABILITY GUIDE CHART

		MAGNITUDE																							
		M. Minimal				1. Very Small				2. Small				3. Medium				4. Large				5. Very Large			
		up to 10 Million				10 - 100 Million				100 Million - 1 Billion				1 - 10 Billion				10 - 100 Billion				> 100 Billion			
	IMPACT	A	C	S	P	A	C	S	P	A	C	S	P	A	C	S	P	A	C	S	P	A	C	S	P
FREEDOM TO ACT	A	8 9 10	10 12 14	14 16 19	19 22 25	10 12 14	14 16 19	19 22 25	25 29 33	14 16 19	19 22 25	25 29 33	33 38 43	19 22 25	25 29 33	33 38 43	43 50 57	25 29 33	33 38 43	43 50 57	57 66 76	33 38 43	43 50 57	57 66 76	76 87 100
	B	12 14 16	16 19 22	22 25 29	29 33 38	16 19 22	22 25 29	29 33 38	38 43 50	22 25 29	29 33 38	38 43 50	50 57 66	29 33 38	38 43 50	50 57 66	66 76 87	38 43 50	50 57 66	66 76 87	87 100 115	50 57 66	66 76 87	87 100 115	115 132 152
	C	19 22 25	25 29 33	33 38 43	43 50 57	25 29 33	33 38 43	43 50 57	57 66 76	33 38 43	43 50 57	57 66 76	76 87 100	43 50 57	57 66 76	76 87 100	100 115 132	57 66 76	76 87 100	100 115 132	132 152 175	76 87 100	100 115 132	132 152 175	175 200 230
	D	29 33 38	38 43 50	50 57 66	66 76 87	38 43 50	50 57 66	66 76 87	87 100 115	50 57 66	66 76 87	87 100 115	115 132 152	66 76 87	87 100 115	115 132 152	152 175 200	87 100 115	115 132 152	152 175 200	200 230 264	115 132 152	152 175 200	200 230 264	264 304 350
	E	43 50 57	57 66 76	76 87 100	100 115 132	57 66 76	76 87 100	100 115 132	132 152 175	76 87 100	100 115 132	132 152 175	175 200 230	100 115 132	132 152 175	175 200 230	230 264 304	132 152 175	175 200 230	230 264 304	304 350 400	175 200 230	230 264 304	304 350 400	400 460 528
	F	66 76 87	87 100 115	115 132 152	152 175 200	87 100 115	115 132 152	152 175 200	200 230 264	115 132 152	152 175 200	200 230 264	264 304 350	152 175 200	200 230 264	264 304 350	350 400 460	200 230 264	264 304 350	350 400 460	460 528 608	264 304 350	350 400 460	460 528 608	608 700 800
	G	100 115 132	132 152 175	175 200 230	230 264 304	132 152 175	175 200 230	230 264 304	304 350 400	175 200 230	230 264 304	304 350 400	400 460 528	230 264 304	304 350 400	400 460 528	528 608 700	304 350 400	400 460 528	528 608 700	700 800 920	400 460 528	528 608 700	700 800 920	920 1056 1216
	H	152 175 200	200 230 264	264 304 350	350 400 460	200 230 264	264 304 350	350 400 460	460 528 608	264 304 350	350 400 460	460 528 608	608 700 800	350 400 460	460 528 608	608 700 800	800 920 1056	460 528 608	608 700 800	800 920 1056	1056 1216 1400	608 700 800	800 920 1056	1056 1216 1400	1400 1600 1840

LESS LIKELY MOST LIKELY

WORKING CONDITION GUIDE CHART

Physical Effort Physical Environment Sensory Attention Mental Stress	Level of Intensity	Combination of Frequency and Duration Expressed in Hours per Day				
		< 1	1 - 2	2 - 4	4 - 6	> 6
		< 15%	15% - 25%	25% - 50%	50% - 75%	> 75%
	A. Minimal	1	2	3	4	5
	B. Moderate	6	7	8	9	10
	C. Substansial	12	14	16	19	22
	D. Extreme	25	29	33	38	43

CHAPTER 6
CONCLUSION AND RECOMMENDATION

This chapter gives conclusions that answer objectives in the first chapter. Furthermore, recommendations are provided for company improvement and future research.

6.1 Conclusions

Conclusions that can be obtained from this research are:

1. Objective workload of Medical Record unit was 289.96 kcal/hour (medium), IGD unit was 143.65 kcal/hour (light), and Inpatient unit was 119.18 kcal/hour (light). While subjective workload of Medical Record unit 79.75 (high), IGD unit 82.01 (very high), and Inpatient unit 78.40 (high).
2. Hay Score for Medical Record job was 295 while Junior Nurse was 394. Both of them were considered as staff.
3. Incentive design by adding workload assessment into grading score allows Medical Record to receive Rp 933,333; IGD Rp 2,933,333; Inpatient Rp 2,933,333. On the other hand, incentive design by giving bonus to unit with higher workload allows Medical Record to receive Rp 3,068,721; IGD Rp 3,465,639; Inpatient Rp 3,465,639.

6.2 Recommendations

Recommendations are provided for company consideration in managing their business process and provided for future research in order to obtain better result and develop more ideas to solve the problem.

6.2.1 Recommendations for RSPKT

Here are recommendations for RSPKT that can be used as consideration in improving company's business process.

1. In order to reduce Medical Record unit's workload, automation can be used as substitution of human power
2. Use sticker instead of re-writing patient's biodata in medical record form
3. Re-layout to reduce medical record distribution time
4. One coordinator for all nurses to ease the communication between nurses at different units
5. Consider group instead of individual performance in distributing incentive

6.2.2 Recommendation for Future Research

There are also recommendation for future research.

1. Incentive system design should be validated at RSPKT and other hospital with the same job
2. Use objective assessment which focused on mental workload for healthcare service company
3. All unit should be included to see overall condition
4. Next research should be more focused on formulation of objective and subjective workload combination

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BIOGRAPHY

Selma Farista Yulia Puteri was born in Bontang, 20th August 1994. She is the second daughter of Mohammad Yasir and Yulianti Falentina. She has educational background from SD 2 YPK Bontang, SMP YPK Bontang, and SMA YPK Bontang. She was registered in Industrial Engineering Department FTI ITS year 2012 through *SNMPTN Tulis*. During study in Industrial Engineering Department, she has several achievements: chosen as *penerima hibah* PKM-KC 2014, she was also chosen as semifinalist at TPHP FoodPreneur Challenge Season 2. Besides study, she also active in several organization: BEM ITS 2013-2014 as KOMINFO Department's staff, Masyarakat Studi Islam Ulul Ilmi JTI ITS as Female Department's staff in 2013-2014 and as female coordinator of Media Department in 2014-2015. She also has specific interest in drawing and win several contest: 1st winner of Poster Competition Muslimah Fun Day GMAIL 2015, 3rd winner of Komikatur on T-shirt Competition Choco Days 2015 Univarsity, and 2nd winner of Comic Strip GMAIL 2016. She can be reached via email: selma.fyp@gmail.com.