

## BAB II

### LANDASAN TEORI

#### 2.1 Tata Kelola Teknologi Informasi

Tata Kelola Teknologi Informasi atau *IT Governance* adalah salah satu aspek dari tata kelola perusahaan, aspek tersebut terkait dengan pengelolaan penggunaan Teknologi Informasi agar efisien dan efektif serta sesuai dengan visi dan misi dari perusahaan [4]. Tata Kelola Teknologi Informasi fokus pada sumber daya Teknologi Informasi (*hardware, software, system, database, dan network*) yang mana merupakan suatu proses atau metode perusahaan dalam mengarahkan dan mengelola TI agar selaras dengan tujuan bisnis dari perusahaan [7].

*IT Governance* juga merupakan struktur perencanaan bagi para eksekutif pada perusahaan dalam memastikan organisasi TI perusahaan dapat menopang dan memperluas strategi dan tujuan dari perusahaan serta terlaksanakan dengan baik di masa yang sekarang dan akan mendatang [9]. Pedoman mengenai Tata Kelola Teknologi Informasi adalah seperti *COBIT*.

#### 2.1 Tahapan Audit Sistem Informasi

Audit merupakan salah satu mekanisme tata kelola perusahaan yaitu sebagai proses pencarian, pemrosesan, penilaian, dan penyesuaian informasi serta mempunyai tujuan untuk memperoleh keyakinan yang memadai bahwa tidak ada kesalahan dan kecurangan [10]. Salah satu audit yang ada yaitu audit sistem informasi, audit sistem informasi memberikan jaminan perihal sistem TI agar dapat diandalkan, aman, dan tidak rentan terhadap serangan komputer serta memberikan informasi kepada pengguna dan dapat dikelola dengan efisien dalam mencapai manfaat yang diinginkan [11].

Audit sistem informasi fokus pada aspek-aspek sistem informasi yang berbasis komputer, hal ini mencakup evaluasi implementasi, operasi, dan pengendalian berbagai sumber daya komputer yang sesuai serta terkait dengan auditor (orang yang melakukan audit) yang menggunakan berbagai keahlian dan pengetahuan teknis untuk melakukan audit melalui sistem komputer [5].



Gambar 2.1 Tahapan Proses Audit Sistem Informasi

Sumber: [9]

Berdasarkan Gambar 2.1, untuk melakukan audit sistem informasi dilakukan dengan tiga tahapan, yaitu [9]:

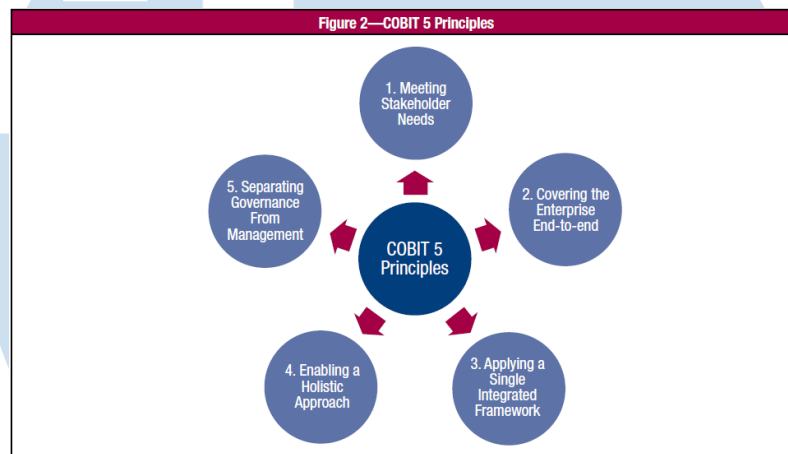
- 1) *Planning*, merupakan tahapan pertama atau awal yang mana menyusun perencanaan perihal identifikasi dan penentuan subjek, tujuan, dan menjabarkan secara rinci seperti apa prosedur nantinya saat audit.
- 2) *Field Work/Documentation*, tahapan ini mengenai kegiatan wawancara dan observasi untuk mengidentifikasi informasi berupa pengambilan data, analisa penemuan dan validasi masalah, serta menentukan hasil temuan dari pihak perusahaan.
- 3) *Reporting/Follow Up*, pada tahapan ini dilakukan pengumpulan hasil audit lalu dilakukan penyusunan temuan audit berupa laporan dengan beberapa bukti yang mendukung temuan tersebut. Laporan dilaporkan kepada pihak perusahaan beserta dengan rekomendasi perbaikan (jika ada) dari temuan dan dilanjutkan dengan melakukan *follow up* agar dapat memastikan untuk perbaikan tersebut ditindaklanjuti (dilaksanakan) oleh pihak perusahaan.

## 2.2 COBIT 5

COBIT atau *Control Objectives For Information and Related Technology* adalah kerangka kerja (*framework*) yang dibuat oleh *Information Systems Audit and Control Association* (ISACA) sebagai pedoman dalam mencapai tujuan manajemen dan tata kelola teknologi informasi pada perusahaan atau organisasi [6]. COBIT memiliki beberapa versi di antaranya adalah COBIT 4.1, COBIT 5, dan COBIT 2019. Salah satu versi COBIT yaitu COBIT 5 merupakan kerangka kerja yang dikeluarkan pada bulan April 2012, versi ini merupakan pembaharuan dari versi sebelumnya yaitu COBIT 4.1.

### 2.3 COBIT 5 Principles

Kerangka kerja *COBIT 5* memiliki lima prinsip yang menjadi dasar dalam pedoman-pedomannya, dapat terlihat pada Gambar 2.2 mengenai prinsip *COBIT 5*. Berikut ini adalah penjelasan mengenai tiap prinsip yang ada pada kerangka kerja *COBIT 5* [6]:



Gambar 2.2 Prinsip COBIT 5

Sumber: [6]

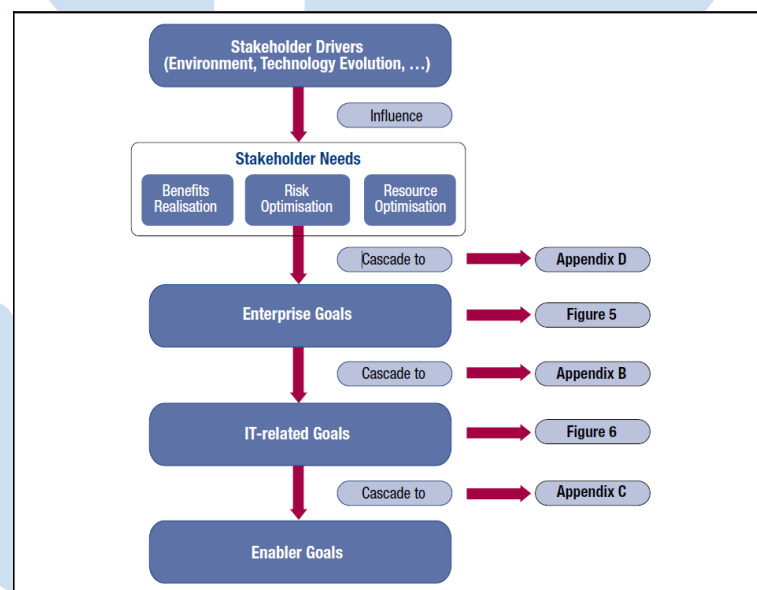
- Prinsip 1: *Meeting Stakeholder Needs*-Menyediakan elemen-elemen yang diperlukan oleh para pemangku kepentingan (*stakeholders*) dalam menciptakan nilai bisnis dari perusahaan khususnya penggunaan TI, sehingga dapat mengoptimalkan risiko dan penggunaan sumber daya yang ada pada perusahaan dengan efisien.
- Prinsip 2: *Covering the Enterprise End-to-end*-Mengintegrasikan tata kelola TI ke dalam tata kelola perusahaan secara menyeluruh (semua fungsi, bagian, dan proses) baik internal maupun eksternal. COBIT 5 tidak fokus hanya ke TI saja, namun dapat menyeluruh ke semua bagian dalam perusahaan.
- Prinsip 3: *Applying a Single Integrated Framework*-Menyediakan kerangka kerja tunggal yang menyeluruh untuk tata kelola dan manajemen TI perusahaan serta sesuai dengan standar dan kerangka kerja TI lainnya.
- Prinsip 4: *Enabling a Holistic Approach*-Menyediakan suatu kumpulan elemen-elemen (*enabler*) yang mendukung penerapan tata kelola dan sistem

manajemen TI yang komprehensif untuk perusahaan. Terdapat tujuh *enablers* yaitu: (1) *Principles, Policies and Frameworks*; (2) *Processes*; (3) *Organizational Structures*; (4) *Culture, Ethics and Behavior*; (5) *Information*; (6) *Services, Infrastructure and Applications*; (7) *People, Skills and Competencies*.

- Prinsip 5: *Separating Governance From Management*-Memisahkan dan menjelaskan perbedaan secara rinci antara tata kelola dengan manajemen.

## 2.4 COBIT 5 Goals Cascade

Kerangka kerja COBIT 5 menyediakan sebuah mekanisme dalam menerjemahkan kebutuhan-kebutuhan para pemangku kepentingan ke dalam *goals* yang lebih spesifik, dapat ditindaklanjuti, dan disesuaikan dengan perusahaan. Berdasarkan Gambar 2.3 *Goals* dibagi menjadi tiga jenis, yaitu [6]: (1) *enterprise goals*, (2) *IT-related goals*, dan (3) *enabler goals*.



Gambar 2.3 Goals Cascading

Sumber: [6]

Untuk dapat mengetahui tiga *goals* tersebut dapat dilakukan dengan melalui empat tahap, yaitu [10]:

- Tahap 1: *Stakeholder Drivers Influence Stakeholder Needs*-Kebutuhan-kebutuhan pemangku kepentingan dipengaruhi oleh perubahan strategi,

lingkungan bisnis, kebijakan dan peraturan yang dapat berubah, dan adanya teknologi baru.

- Tahap 2: *Stakeholder Needs Cascade to Enterprise Goals*-Memetakan kebutuhan-kebutuhan pemangku kepentingan ke dalam tujuan-tujuan perusahaan dengan menggunakan bantuan dari *balanced scorecard (BSC)* yang disediakan oleh kerangka kerja COBIT 5, *BSC* dapat terlihat pada Gambar 2.4 dan Gambar 2.5.

|                                                                                                                                                                    | Stakeholder value of business investments | Portfolio of competitive products and services | Managed business risk (safeguarding of assets) | Compliance with external laws and regulations | Financial transparency | Customer-oriented service culture | Business service continuity and availability | Agile responses to a changing business environment | Information-based strategic decision making | Optimization of service delivery costs | Optimization of business process functionality | Optimization of business process costs | Managed business change programmes | Operational and staff productivity | Compliance with internal policies | Skilled and motivated people | Product and business innovation culture |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------|------------------------------------------------|-----------------------------------------------|------------------------|-----------------------------------|----------------------------------------------|----------------------------------------------------|---------------------------------------------|----------------------------------------|------------------------------------------------|----------------------------------------|------------------------------------|------------------------------------|-----------------------------------|------------------------------|-----------------------------------------|
| STAKEHOLDER NEEDS                                                                                                                                                  | 1.                                        | 2.                                             | 3.                                             | 4.                                            | 5.                     | 6.                                | 7.                                           | 8.                                                 | 9.                                          | 10.                                    | 11.                                            | 12.                                    | 13.                                | 14.                                | 15.                               | 16.                          | 17.                                     |
| How do I get value from the use of IT? Are end users satisfied with the quality of the IT service?                                                                 |                                           |                                                |                                                |                                               |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   |                              |                                         |
| How do I manage performance of IT?                                                                                                                                 |                                           |                                                |                                                |                                               |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   |                              |                                         |
| How can I best exploit new technology for new strategic opportunities?                                                                                             |                                           |                                                |                                                |                                               |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   |                              |                                         |
| How do I best build and structure my IT department?                                                                                                                |                                           |                                                |                                                |                                               |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   |                              |                                         |
| How dependent am I on external providers? How well are IT outsourcing agreements being managed? How do I obtain assurance over external providers?                 |                                           |                                                |                                                |                                               |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   |                              |                                         |
| What are the (control) requirements for information?                                                                                                               |                                           |                                                |                                                |                                               |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   |                              |                                         |
| Did I address all IT-related risk?                                                                                                                                 |                                           |                                                |                                                |                                               |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   |                              |                                         |
| Am I running an efficient and resilient IT operation?                                                                                                              |                                           |                                                |                                                |                                               |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   |                              |                                         |
| How do I control the cost of IT? How do I use IT resources in the most effective and efficient manner? What are the most effective and efficient sourcing options? |                                           |                                                |                                                |                                               |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   |                              |                                         |
| Do I have enough people for IT? How do I develop and maintain their skills, and how do I manage their performance?                                                 |                                           |                                                |                                                |                                               |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   |                              |                                         |
| How do I get assurance over IT?                                                                                                                                    |                                           |                                                |                                                |                                               |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   |                              |                                         |

Gambar 2.4 Enterprise Goals Balanced Score Card Kerangka Kerja COBIT 5

Sumber: [10]

| STAKEHOLDER NEEDS                                                                                                                                      | STAKEHOLDER NEEDS |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
|                                                                                                                                                        | 1.                | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. |
| Is the information I am processing well secured?                                                                                                       |                   |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |
| How do I improve business agility through a more flexible IT environment?                                                                              |                   |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |
| Do IT projects fail to deliver what they promised—and if so, why? Is IT standing in the way of executing the business strategy?                        |                   |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |
| How critical is IT to sustaining the enterprise? What do I do if IT is not available?                                                                  |                   |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |
| What concrete vital primary business processes are dependent on IT, and what are the requirements of business processes?                               |                   |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |
| What has been the average overrun of the IT operational budgets? How often and how much do IT projects go over budget?                                 |                   |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |
| How much of the IT effort goes to fighting fires rather than to enabling business improvements?                                                        |                   |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |
| Are sufficient IT resources and infrastructure available to meet required enterprise strategic objectives?                                             |                   |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |
| How long does it take to make major IT decisions?                                                                                                      |                   |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |
| Are the total IT effort and investments transparent?                                                                                                   |                   |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |
| Does IT support the enterprise in complying with regulations and service levels? How do I know whether I am compliant with all applicable regulations? |                   |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |

Gambar 2.5 Enterprise Goals Balanced Score Card Kerang Kerja COBIT 5 (Lanjutan)

Sumber: [10]

Pada *BSC* yang ada pada Gambar 2.6 terdapat empat kategori yang membagi tiap *Enterprise Goals*, yaitu: (1) *Financial*, (2) *Customer*, (3) *Internal*, (4) *Learning and Growth*.

| BSC Dimension       | Enterprise Goal                                       | Relation to Governance Objectives |                   |                       |
|---------------------|-------------------------------------------------------|-----------------------------------|-------------------|-----------------------|
|                     |                                                       | Benefits Realisation              | Risk Optimisation | Resource Optimisation |
| Financial           | 1. Stakeholder value of business investments          | P                                 |                   | S                     |
|                     | 2. Portfolio of competitive products and services     | P                                 | P                 | S                     |
|                     | 3. Managed business risk (safeguarding of assets)     |                                   | P                 | S                     |
|                     | 4. Compliance with external laws and regulations      |                                   | P                 |                       |
|                     | 5. Financial transparency                             | P                                 | S                 | S                     |
| Customer            | 6. Customer-oriented service culture                  | P                                 |                   | S                     |
|                     | 7. Business service continuity and availability       |                                   | P                 |                       |
|                     | 8. Agile responses to a changing business environment | P                                 |                   | S                     |
|                     | 9. Information-based strategic decision making        | P                                 | P                 | P                     |
|                     | 10. Optimisation of service delivery costs            | P                                 |                   | P                     |
| Internal            | 11. Optimisation of business process functionality    | P                                 |                   | P                     |
|                     | 12. Optimisation of business process costs            | P                                 |                   | P                     |
|                     | 13. Managed business change programmes                | P                                 | P                 | S                     |
|                     | 14. Operational and staff productivity                | P                                 |                   | P                     |
|                     | 15. Compliance with internal policies                 |                                   | P                 |                       |
| Learning and Growth | 16. Skilled and motivated people                      | S                                 | P                 | P                     |
|                     | 17. Product and business innovation culture           | P                                 |                   |                       |

Gambar 2.6 Pembagian 4 Dimensi Enterprise Goals

Sumber: [10]

- Tahap 3: Enterprise Goals Cascade to IT-related Goals-Memetakan hasil dari tahap ke-2 (Enterprise Goals) ke dalam tujuan-tujuan terkait TI (IT-related Goals) dengan menggunakan IT Balanced Scorecard (IT BSC).

|                     |    |                                                                                                                 | Enterprise Goal                           |                                                |                                               |                                               |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   |                              |                                                     |
|---------------------|----|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------|-----------------------------------------------|-----------------------------------------------|------------------------|-----------------------------------|----------------------------------------------|----------------------------------------------------|---------------------------------------------|----------------------------------------|------------------------------------------------|----------------------------------------|------------------------------------|------------------------------------|-----------------------------------|------------------------------|-----------------------------------------------------|
|                     |    |                                                                                                                 | 1.                                        | 2.                                             | 3.                                            | 4.                                            | 5.                     | 6.                                | 7.                                           | 8.                                                 | 9.                                          | 10.                                    | 11.                                            | 12.                                    | 13.                                | 14.                                | 15.                               | 16.                          | 17.                                                 |
|                     |    |                                                                                                                 | Stakeholder value of business investments | Portfolio of competitive products and services | Managed business risk (outsparring of assets) | Compliance with external laws and regulations | Financial transparency | Customer-oriented service culture | Business service continuity and availability | Agile responses to a changing business environment | Information-based strategic decision making | Optimisation of service delivery costs | Optimisation of business process functionality | Optimisation of business process costs | Managed business change programmes | Operational and staff productivity | Compliance with internal policies | Skilled and motivated people | Developed and business-critical information systems |
| IT-related Goal     |    |                                                                                                                 | Financial                                 |                                                |                                               |                                               | Customer               |                                   |                                              |                                                    |                                             |                                        | Internal                                       |                                        |                                    |                                    |                                   | Learning and Growth          |                                                     |
| Financial           | 01 | Alignment of IT and business strategy                                                                           | P                                         | P                                              | S                                             |                                               |                        | P                                 | S                                            | P                                                  | P                                           | S                                      | P                                              | S                                      | P                                  |                                    |                                   | S                            | S                                                   |
|                     | 02 | IT compliance and support for business compliance with external laws and regulations                            |                                           |                                                | S                                             | P                                             |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    | P                                 |                              |                                                     |
|                     | 03 | Commitment of executive management for making IT-related decisions                                              | P                                         | S                                              | S                                             |                                               |                        |                                   | S                                            | S                                                  |                                             |                                        | S                                              |                                        | P                                  |                                    |                                   | S                            | S                                                   |
|                     | 04 | Managed IT-related business risk                                                                                |                                           |                                                | P                                             | S                                             |                        |                                   | P                                            | S                                                  |                                             | P                                      |                                                |                                        | S                                  |                                    | S                                 | S                            |                                                     |
|                     | 05 | Realised benefits from IT-enabled investments and services portfolio                                            | P                                         | P                                              |                                               |                                               |                        | S                                 |                                              | S                                                  |                                             | S                                      | S                                              | P                                      |                                    | S                                  |                                   |                              | S                                                   |
|                     | 06 | Transparency of IT costs, benefits and risk                                                                     | S                                         |                                                | S                                             |                                               | P                      |                                   |                                              |                                                    | S                                           | P                                      |                                                | P                                      |                                    |                                    |                                   |                              |                                                     |
| Customer            | 07 | Delivery of IT services in line with business requirements                                                      | P                                         | P                                              | S                                             | S                                             |                        | P                                 | S                                            | P                                                  | S                                           |                                        | P                                              | S                                      | S                                  |                                    | S                                 | S                            |                                                     |
|                     | 08 | Adequate use of applications, information and technology solutions                                              | S                                         | S                                              | S                                             |                                               |                        | S                                 | S                                            | S                                                  | S                                           | S                                      | P                                              | S                                      |                                    | P                                  |                                   | S                            | S                                                   |
| Internal            | 09 | IT agility                                                                                                      | S                                         | P                                              | S                                             |                                               |                        | S                                 |                                              | P                                                  |                                             |                                        | P                                              |                                        | S                                  | S                                  |                                   | S                            | P                                                   |
|                     | 10 | Security of information, processing infrastructure and applications                                             |                                           |                                                | P                                             | P                                             |                        |                                   | P                                            |                                                    |                                             |                                        |                                                |                                        |                                    |                                    | P                                 |                              |                                                     |
|                     | 11 | Optimisation of IT assets, resources and capabilities                                                           | P                                         | S                                              |                                               |                                               |                        |                                   | S                                            |                                                    | S                                           | P                                      | S                                              | P                                      | S                                  | S                                  |                                   |                              | S                                                   |
|                     | 12 | Enablement and support of business processes by integrating applications and technology into business processes | S                                         | P                                              | S                                             |                                               |                        | S                                 |                                              | S                                                  |                                             | S                                      | P                                              | S                                      | S                                  | S                                  |                                   |                              | S                                                   |
|                     | 13 | Delivery of programmes delivering benefits, on time, on budget, and meeting requirements and quality standards  | P                                         | S                                              | S                                             | S                                             |                        |                                   |                                              |                                                    |                                             | S                                      |                                                | S                                      | P                                  |                                    |                                   |                              |                                                     |
|                     | 14 | Availability of reliable and useful information for decision making                                             | S                                         | S                                              | S                                             | S                                             |                        |                                   | P                                            |                                                    | P                                           |                                        | S                                              |                                        |                                    |                                    |                                   |                              |                                                     |
|                     | 15 | IT compliance with internal policies                                                                            |                                           |                                                | S                                             | S                                             |                        |                                   |                                              |                                                    |                                             |                                        |                                                |                                        |                                    |                                    |                                   | P                            |                                                     |
| Learning and Growth | 16 | Competent and motivated business and IT personnel                                                               | S                                         | S                                              | P                                             |                                               |                        | S                                 |                                              | S                                                  |                                             |                                        |                                                |                                        |                                    | P                                  |                                   | P                            | S                                                   |
|                     | 17 | Knowledge, expertise and initiatives for business innovation                                                    | S                                         | P                                              |                                               |                                               |                        | S                                 |                                              | P                                                  | S                                           |                                        | S                                              |                                        | S                                  |                                    |                                   | S                            | P                                                   |

Gambar 2.7 IT Balanced Scorecard

Sumber: [10]

Berdasarkan gambar 2.7 terdapat 17 *IT-related Goals* yang disediakan oleh COBIT 5. 17 *IT-related Goals* tersebut dikelompokkan menjadi 4 dimensi (kategori) yang dapat dilihat pada Gambar 2.8.

U N I V E R S I T A S  
M U L T I M E D I A  
N U S A N T A R A

| IT BSC Dimension    |    | Information and Related Technology Goal                                                                         |
|---------------------|----|-----------------------------------------------------------------------------------------------------------------|
| Financial           | 01 | Alignment of IT and business strategy                                                                           |
|                     | 02 | IT compliance and support for business compliance with external laws and regulations                            |
|                     | 03 | Commitment of executive management for making IT-related decisions                                              |
|                     | 04 | Managed IT-related business risk                                                                                |
|                     | 05 | Realised benefits from IT-enabled investments and services portfolio                                            |
|                     | 06 | Transparency of IT costs, benefits and risk                                                                     |
| Customer            | 07 | Delivery of IT services in line with business requirements                                                      |
|                     | 08 | Adequate use of applications, information and technology solutions                                              |
| Internal            | 09 | IT agility                                                                                                      |
|                     | 10 | Security of information, processing infrastructure and applications                                             |
|                     | 11 | Optimisation of IT assets, resources and capabilities                                                           |
|                     | 12 | Enablement and support of business processes by integrating applications and technology into business processes |
|                     | 13 | Delivery of programmes delivering benefits, on time, on budget, and meeting requirements and quality standards  |
|                     | 14 | Availability of reliable and useful information for decision making                                             |
|                     | 15 | IT compliance with internal policies                                                                            |
| Learning and Growth | 16 | Competent and motivated business and IT personnel                                                               |
|                     | 17 | Knowledge, expertise and initiatives for business innovation                                                    |

Gambar 2.8 Pembagian 4 Dimensi IT-related Goals

Sumber: [10]

- Tahap 4: *IT-related Goals Cascade to Enabler Goals*

|                              |       | IT-related Goal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |    |    |    |          |    |    |          |    |    |    |    |    |    |                     |    |
|------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----------|----|----|----------|----|----|----|----|----|----|---------------------|----|
|                              |       | <div>Alignment of IT and business strategy</div> <div>IT compliance and support for business compliance with external laws and regulations</div> <div>Commitment of executive management for making IT-related decisions</div> <div>Managed IT-related business risk</div> <div>Realised benefits from IT-enabled investments and services portfolio</div> <div>Transparency of IT costs, benefits and risk</div> <div>Delivery of IT services in line with business requirements and customer expectations</div> <div>IT skill V</div> <div>Security of information, processing infrastructure and applications</div> <div>Optimisation of IT assets, resources and capabilities</div> <div>Enablement and support of business processes and business solutions and technology into business processes</div> <div>Delivery of programmes delivering benefits, on time, on budget, and meeting requirements and quality standards</div> <div>Availability of reliable and useful information for decision making</div> <div>IT compliance with external policies</div> <div>Competent and motivated business and IT personnel</div> <div>Knowledge, expertise and values for business</div> |    |    |    |    |          |    |    |          |    |    |    |    |    |    |                     |    |
|                              |       | 01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 02 | 03 | 04 | 05 | 06       | 07 | 08 | 09       | 10 | 11 | 12 | 13 | 14 | 15 | 16                  | 17 |
| COBIT 5 Process              |       | Financial                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    |    |    |    | Customer |    |    | Internal |    |    |    |    |    |    | Learning and Growth |    |
| Evaluate, Direct and Monitor | EDM01 | Ensure Governance Framework Setting and Maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | P  | S  | P  | S  | S        | P  |    | S        | S  | S  | S  | S  | S  | S  | S                   |    |
|                              | EDM02 | Ensure Benefits Delivery                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | P  |    | S  |    | P        | P  | P  | S        |    |    | S  | S  | S  | S  | S                   | P  |
|                              | EDM03 | Ensure Risk Optimisation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | S  | S  | S  | P  |          | P  | S  | S        |    | P  |    |    | S  | S  | P                   | S  |
|                              | EDM04 | Ensure Resource Optimisation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | S  |    | S  | S  | S        | S  | S  | P        |    |    | P  |    |    |    |                     | P  |
|                              | EDM05 | Ensure Stakeholder Transparency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | S  | S  | P  |    |          | P  | P  |          |    |    |    |    |    | S  | S                   | S  |
| Align, Plan and Organise     | AP001 | Manage the IT Management Framework                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | P  | P  | S  | S  |          | S  |    | P        | S  | P  | S  | S  | S  | P  | P                   | P  |
|                              | AP002 | Manage Strategy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | P  |    | S  | S  | S        |    | P  | S        | S  | S  | S  | S  | S  | S  | S                   | P  |
|                              | AP003 | Manage Enterprise Architecture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | P  |    | S  | S  | S        | S  | S  | P        | S  | P  | S  |    |    | S  |                     | S  |
|                              | AP004 | Manage Innovation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | S  |    |    | S  | P        |    |    | P        | P  |    | P  | S  |    |    |                     | P  |
|                              | AP005 | Manage Portfolio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | P  | S  | P  | S  | P        | S  | S  | S        |    | S  |    |    | P  |    |                     | S  |
|                              | AP006 | Manage Budget and Costs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | S  |    | S  | S  | P        | P  | S  | S        |    |    | S  |    |    |    |                     |    |
|                              | AP007 | Manage Human Resources                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | P  | S  | S  | S  |          |    | S  |          | S  | S  | P  |    | P  |    | S                   | P  |
|                              | AP008 | Manage Relationships                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | P  |    | S  | S  | S        | P  | S  |          |    | S  | P  |    | S  | S  | S                   | P  |
|                              | AP009 | Manage Service Agreements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | S  |    |    | S  | S        | S  | P  | S        | S  | S  | S  |    | S  | P  | S                   |    |
|                              | AP010 | Manage Suppliers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |    | S  |    | P  | S        | S  | P  | S        | P  | S  |    |    | S  | S  | S                   | S  |
|                              | AP011 | Manage Quality                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | S  | S  |    | S  | P        |    | P  | S        | S  |    | S  |    | P  | S  | S                   | S  |
|                              | AP012 | Manage Risk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |    | P  |    | P  |          | P  | S  | S        | S  | P  |    |    | P  | S  | S                   | S  |
|                              | AP013 | Manage Security                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    | P  |    | P  |          | P  | S  | P        | S  |    |    |    | P  | P  |                     |    |

Gambar 2.9 Enabler Goals Balanced Score Card

Sumber: [10]

|  |  | IT-related Goal                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|--|--|--------------------------------------------------------------------------------------|----|----|------------------------------------------------------------------------|----|----|----------------------------------|----|----|---------------------------------------------------------------------|----|----|---------------------------------------------|----|----|------------------------------------------------------------|----|--|--------------------------------------------------------------------|--|--|------------|--|--|---------------------------------------------------------------------|--|--|-------------------------------------------------------|--|--|----------------------------------------------|--|--|----------------------------------------------------------------|--|--|------------------------------------------------------------------------------------------------------------|--|--|---------------------------------------------------------------------|--|--|--------------------------------------|--|--|---------------------------------------------------|--|--|---------------------------------------------------|
|  |  | Alignment of IT and business strategy                                                |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  | IT compliance and support for business compliance with external laws and regulations |    |    | Commitment of executive management for making IT-related business risk |    |    | Managed IT-related business risk |    |    | Realised benefits from IT-enabled investments and service portfolio |    |    | Transparency of IT costs, benefits and risk |    |    | Delivery of IT services in line with business requirements |    |  | Adoptive use of applications, information and technology solutions |  |  | IT agility |  |  | Security of information, processing infrastructure and applications |  |  | Optimisation of IT assets, resources and capabilities |  |  | Enablement and support of business processes |  |  | Integration of business and technology into business processes |  |  | Delivery of programmes delivering benefits, on time, on budget, meeting requirements and quality standards |  |  | Availability of reliable and useful information for decision making |  |  | IT compliance with internal policies |  |  | Competent and motivated business and IT personnel |  |  | Knowledge, expertise and initiatives for business |
|  |  | 01                                                                                   | 02 | 03 | 04                                                                     | 05 | 06 | 07                               | 08 | 09 | 10                                                                  | 11 | 12 | 13                                          | 14 | 15 | 16                                                         | 17 |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
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|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
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|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
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|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
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|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
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|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |
|  |  |                                                                                      |    |    |                                                                        |    |    |                                  |    |    |                                                                     |    |    |                                             |    |    |                                                            |    |  |                                                                    |  |  |            |  |  |                                                                     |  |  |                                                       |  |  |                                              |  |  |                                                                |  |  |                                                                                                            |  |  |                                                                     |  |  |                                      |  |  |                                                   |  |  |                                                   |

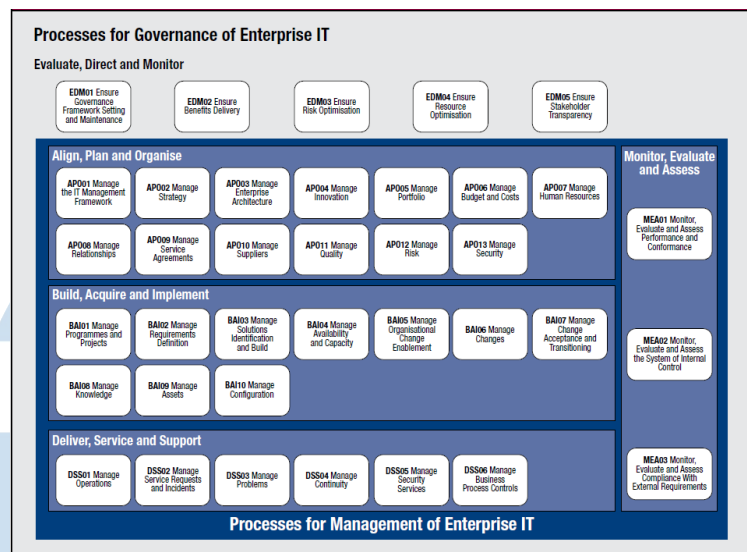
Gambar 2.10 Enabler Goals Balanced Score Card (Lanjutan)

Sumber: [10]

Memetakan hasil dari tahap ke-3 (IT-related Goals) ke dalam Enabler Goals (Process, Organizational structure, and information) dengan menggunakan *BSC Enabler Goals* yang dapat dilihat pada Gambar 2.9 dan Gambar 2.10. Pada COBIT 5 terdapat total 37 Enabler Goals.

## 2.5 COBIT 5 Domain

Terdapat lima *domains* yang ada pada kerangka kerja COBIT 5, lima *domains* tersebut terbagi menjadi dua area yaitu *Governance* dan *Management*.



Gambar 2.11 37 Sub-domains Kerangka Kerja COBIT 5

Sumber: [10]

Berdasarkan Gambar 2.11, berikut ini adalah *domains* yang ada pada kerangka kerja COBIT 5 [10]:

- Area Governance
  - Evaluate, Direct and Monitor (EDM).
- Area Management
  - Align, Plan and Organize (APO)
  - Build, Acquire and Implement (BAI)
  - Deliver, Service and Support (DSS)
  - Monitor, Evaluate and Assess (MEA).

#### 1) Evaluate, Direct and Monitor (EDM)

Domain EDM berfokus pada tujuan dari tata kelola pemangku kepentingan seperti pengiriman nilai, optimalisasi risiko, dan optimalisasi sumber daya pada perusahaan [11]. Pada domain EDM terdapat lima Processes, yaitu [10]:

- EDM01 Ensure Governance Framework Setting and Maintenance
- EDM02 Ensure Benefits Delivery
- EDM03 Ensure Risk Optimization
- EDM04 Ensure Resource Optimization
- EDM05 Ensure Stakeholder Transparency.

## 2) Align, Plan and Organize (APO)

*Domain APO* berfokus pada penyelarasan, perencanaan, dan pengaturan agar TI dapat berkontribusi untuk mencapai tujuan bisnis dari perusahaan [12]. Pada *domain APO* terdapat 13 *Processes*, yaitu [10]:

- *APO01 Manage the IT Management Framework*
- *APO02 Manage Strategy*
- *APO03 Manage Enterprise Architecture*
- *APO04 Manage Innovation*
- *APO05 Manage Portfolio*
- *APO06 Manage Budget and Costs*
- *APO07 Manage Human Resources*
- *APO08 Manage Relationships*
- *APO09 Manage Service Agreements*
- *APO10 Manage Suppliers*
- *APO11 Manage Quality*
- *APO12 Manage Risk*
- *APO13 Manage Security.*

## 3) Build, Acquire and Implement (BAI)

*Domain BAI* berfokus pada identifikasi kebutuhan-kebutuhan TI, perolehan teknologi, dan keberhasilan penerapan atau realisasinya dalam proses bisnis yang ada pada perusahaan [13]. Pada *domain BAI* terdapat 10 *Processes*, yaitu [10]:

- *BAI01 Manage Programs and Projects*
- *BAI02 Manage Requirements Definition*
- *BAI03 Manage Solutions Identification and Build*
- *BAI04 Manage Availability and Capacity*
- *BAI05 Manage Organizational Change Enablement*
- *BAI06 Manage Changes*
- *BAI07 Manage Change Acceptance and Transitioning*
- *BAI08 Manage Knowledge*
- *BAI09 Manage Assets*

- *BAI10 Manage Configuration.*

#### 4) Deliver, Service and Support (DSS)

*Domain DSS* berfokus pada pemberian pelayanan dan pengelolaan proses TI yang ada pada perusahaan [14]. Pada *domain DSS* terdapat 6 *Processes*, yaitu [10]:

- *DSS01 Manage Operations*
- *DSS02 Manage Service Request and Incidents*
- *DSS03 Manage Problems*
- *DSS04 Manage Continuity*
- *DSS05 Manage Security Services*
- *DSS06 Manage Business Process Controls.*

#### 5) Monitor, Evaluate and Assess (MEA)

*Domain MEA* berfokus pada pemantauan proses-proses agar dapat sesuai arahan yang ada, serta dapat mengelola kinerja, memantau pengendalian internal, dan patuh pada peraturan dan kebijakan tata kelola perusahaan [15]. Pada *domain MEA* terdapat 3 *Processes*, yaitu [10]:

- *MEA01 Monitor, Evaluate and Assess Performance and Conformance*
- *MEA02 Monitor, Evaluate and Assess the System of Internal Control*
- *MEA03 Monitor, Evaluate and Assess Compliance with External Requirements.*

## 2.6 RACI Chart

*RACI chart* merupakan salah satu mekanisme yang disediakan kerangka kerja COBIT 5 yang digunakan untuk mengidentifikasi siapa saja yang berperan dan bersangkutan pada setiap *Domain* dan *sub-Domain* terpilih, hal tersebut dilakukan untuk keperluan identifikasi dan analisa (penilaian) [16]. Penggunaan *RACI chart* harus sesuai dengan tiap *Domain* dan *sub-Domain*, terdapat kemungkinan adanya perbedaan antara orang yang bersangkutan. *RACI chart* adalah sebuah akronim, berikut ini adalah penjelasannya [10]:

- *R (responsible)*-Siapa yang dapat menyelesaikan tugas? Siapa yang bertanggung jawab atas aktivitas tersebut? Hal ini mengacu pada peran yang menjalankan aktivitas yang ada.
- *A (accountable)*-Siapa yang bertanggung jawab atas keberhasilan tugas? Siapa yang memiliki otoritas dalam mengambil keputusan terkait tugas atau aktivitas tersebut?.
- *C (consulted)*-Siapa yang ahli pada aktivitas atau tugas tersebut? Siapa yang dapat memberikan saran perihal tugas atau aktivitas tersebut?.
- *I (informed)*-Siapa yang mendapatkan informasi perihal aktivitas atau tugas yang sedang berjalan? Seluruh keputusan dan perubahan yang ada, harus diberitahukan kepada orang tersebut.

## 2.7 COBIT 5 Rating

Setiap *Domain*, *sub-Domain*, dan *Process* diberi nilai menggunakan skala peringkat COBIT 5 yang berdasarkan standar ISO/IEC 15504 yang mana dapat terlihat pada Gambar 2.12, peringkat-peringkat tersebut adalah sebagai berikut [10]:

| Abbreviation | Description        | % Achieved               |
|--------------|--------------------|--------------------------|
| N            | Not achieved       | 0 to 15% achievement     |
| P            | Partially achieved | >15% to 50% achievement  |
| L            | Largely achieved   | >50% to 85% achievement  |
| F            | Fully achieved     | >85% to 100% achievement |

Source: This figure is reproduced from ISO/IEC 15504-2:2003, with the permission of ISO/IEC at [www.iso.org](http://www.iso.org). Copyright remains with ISO/IEC.

Gambar 2.12 Penilaian Sub-processes Kerangka Kerja COBIT 5

Sumber: [10]

- *N (Not achieved)*. Tidak ada atau terdapat hanya sedikit bukti pencapaian pada atribut (*Process*).
- *P (Partially achieved)*. Terdapat beberapa bukti pendekatan dan beberapa pencapaian pada atribut, serta beberapa aspek pencapaian atribut tidak dapat diprediksi.
- *L (Largely achieved)*. Terdapat bukti pada pendekatan yang sistematis dan pencapaian yang signifikan pada atribut, serta terdapat beberapa kelemahan terkait dengan atribut yang ada.

- *F (Fully achieved)*. Terdapat bukti pada pendekatan yang lengkap dan sistematis, dapat tercapai dengan penuh pada atribut, serta tidak ada kelemahan signifikan terkait dengan atribut.

## 2.8 COBIT 5 Capability Level

*Capability level* atau tingkat kapabilitas merupakan salah satu mekanisme yang disediakan kerangka kerja *COBIT 5* yang digunakan untuk mengukur tingkat dari kemampuan dari suatu perusahaan, khususnya pada salah satu atau beberapa divisi pada perusahaan yang dijadikan objek untuk diukur [17]. Pengukuran tingkat kapabilitas terbagi menjadi tiga tahap, (1) menentukan hasil rata-rata dari tiap *Processes* dengan rumus pada gambar 2.13,

$$\text{Nilai rata - rata Tingkat Kapabilitas Process} = \sum \frac{\text{Nilai sub - Processes}}{\text{Sub - Processes}}$$

Gambar 2.13 Rumus Perhitungan Nilai Rata-rata Tingkat Kapabilitas

Sumber: [18]

(2) menentukan hasil rata-rata dari tiap *sub-Domains* dengan rumus pada gambar 2.14,

$$\text{Nilai rata - rata Tingkat Kapabilitas sub - Domain} = \sum \frac{\text{Nilai rata - rata Processes}}{\text{Processes}}$$

Gambar 2.14 Rumus Perhitungan Nilai Rata-rata Tingkat Kapabilitas Sub-domains

Sumber: [18]

(3) menentukan Tingkat Kapabilitas berdasarkan hasil rata-rata dari tiap *sub-Domains*. Gambar 2.15 menunjukkan skala penilaian Tingkat Kapabilitas.

U N I V E R S I T A S  
M U L T I M E D I A  
N U S A N T A R A

| Process Attribute ID                                                                                                                                              | Capability Levels and Process Attributes |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
|                                                                                                                                                                   | Level 0: Incomplete process              |
|                                                                                                                                                                   | Level 1: Performed process               |
| PA 1.1                                                                                                                                                            | Process performance                      |
|                                                                                                                                                                   | Level 2: Managed process                 |
| PA 2.1                                                                                                                                                            | Performance management                   |
| PA 2.2                                                                                                                                                            | Work product management                  |
|                                                                                                                                                                   | Level 3: Established process             |
| PA 3.1                                                                                                                                                            | Process definition                       |
| PA 3.2                                                                                                                                                            | Process deployment                       |
|                                                                                                                                                                   | Level 4: Predictable process             |
| PA 4.1                                                                                                                                                            | Process measurement                      |
| PA 4.2                                                                                                                                                            | Process control                          |
|                                                                                                                                                                   | Level 5: Optimizing process              |
| PA 5.1                                                                                                                                                            | Process innovation                       |
| PA 5.2                                                                                                                                                            | Process optimization                     |
| Source: This figure is adapted from ISO/IEC 15504-2:2003 with the permission of ISO at <a href="http://www.iso.org">www.iso.org</a> . Copyright remains with ISO. |                                          |

Gambar 2.15 Tingkatan Kapabilitas Kerangka Kerja COBIT 5

Sumber: [19]

Berdasarkan Gambar 2.15, skala penilaian dalam pengukuran melibatkan 6 tingkat kapabilitas, berikut ini adalah tiap tingkatannya [19]:

- *Level 0 Incomplete Process*-Proses yang ada tidak diimplementasikan atau tidak dapat mencapai tujuan dari proses tersebut, serta ada sedikit atau tidak ada bukti sama sekali.
- *Level 1 Performed process (one attribute)*-Proses yang ada dapat diimplementasikan dalam mencapai tujuannya.
- *Level 2 Managed process (two attribute)*-Proses yang ada selain dapat diimplementasikan, dapat dikelola, dikendalikan, dan dipelihara dengan baik dan sesuai kebutuhan.
- *Level 3 Established process (two attribute)*-Proses yang ada selain sudah dapat sesuai dengan atribut pada tingkat 2, dapat diimplementasikan menggunakan proses yang ditentukan.
- *Level 4 Predictable process (two attribute)*-Proses yang ada selain dapat sesuai dengan atribut pada tingkat 3, dapat beroperasi dalam batas yang sudah ditentukan dalam mencapai hasil dari proses tersebut.

- *Level 5 Optimizing process (two attribute)*-Proses yang ada selain dapat sesuai dengan atribut pada tingkat 4, dapat tingkatkan secara terus menerus untuk dapat memenuhi tujuan bisnis yang sesuai saat ini dan mendatang.

## 2.9 Gap Analysis

*Gap Analysis* atau analisa kesenjangan merupakan suatu metode dalam mengidentifikasi adanya kesenjangan antara dua variabel atau lebih [20]. Pada tata kelola TI juga dilakukan analisa kesenjangan dalam melakukan tahapan audit sistem informasi, variabel pertama merupakan variabel yang menggambarkan kondisi yang diinginkan atau variabel prediksi, sedangkan variabel kedua merupakan variabel yang menggambarkan kondisi saat ini atau sebenarnya. Rumus untuk mengidentifikasi adanya kesenjangan adalah pada Gambar 2.16:

$$\text{Nilai Kesenjangan} = \text{Variabel pertama} - \text{Variabel kedua}$$

Gambar 2.16 Rumus Pengukuran Nilai Kesenjangan

Sumber: [18]

Hasil dari analisa kesenjangan akan dilakukan evaluasi, evaluasi ini berupa penyesuaian Nilai Kesenjangan dengan tiga kondisi. Hasil akhir dari evaluasi adalah berupa kesimpulan, berikut ini adalah tiga kondisi dan kesimpulannya [20]:

- Nilai Kesenjangan  $< 0$ , proses-proses yang dijalankan sudah sangat baik, proses-proses tersebut melebihi dari apa yang sudah ditargetkan atau diharapkan.
- Nilai Kesenjangan  $= 0$ , proses-proses yang dijalankan sudah cukup baik, proses-proses tersebut sesuai dengan apa yang sudah diharapkan.
- Nilai Kesenjangan  $> 0$ , proses-proses yang dijalankan kurang baik, proses-proses tersebut tidak dapat sesuai dengan harapan, serta diperlukan adanya rekomendasi untuk dapat meningkatkan dan menyesuaikan proses-proses tersebut dengan apa yang sudah diharapkan.

## 2.10 Penelitian Terdahulu

Untuk melakukan penelitian ini diperlukan sumber-sumber untuk dijadikan pedoman dan landasan, sumber-sumber tersebut berupa penelitian-penelitian yang

sudah dilakukan oleh para peneliti lain sebelumnya yang mana berhubungan pada topik dari penelitian ini. Berikut ini adalah Tabel 2.1 mengenai empat penelitian terdahulu yang dijadikan sebagai acuan pada penelitian ini:

Tabel 2.1 Evaluasi Empat Penelitian Terdahulu

| ARTIKEL PERTAMA   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Judul Artikel     | Audit Tata Kelola Teknologi Informasi Menggunakan <i>Framework</i> COBIT 5 (Studi Kasus: PT Pelabuhan Indonesia II (Persero) Cabang Panjang).                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Nama Jurnal       | Jurnal Ilmiah Infrastruktur Teknologi Informasi (JIITI), Vol. 1, No. 1, Hal. 13-19, Tahun 2020.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Penulis           | Adhie Thyo Priandika, Sherly Octavia.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Permasalahan      | Kegiatan tata kelola teknologi informasi pada Pelabuhan Indonesia Cabang Panjang saat ini telah dilakukan secara berkala belum dilakukan secara maksimal pada penerapan sistem <i>VGM (Verified Gross Mass)</i> yang mana saat ini baru diimplementasikan, sehingga belum diketahui tingkat kematangan, apakah sudah mendukung proses bisnis dalam memberikan pelayanan operasional pada peti kemas [21]. Maka dari itu, untuk mengetahui tingkat kematangan dari penerapan sistem secara maksimal dalam memberikan pelayanan operasional bisnis diperlukan evaluasi Audit Tata Kelola Teknologi Informasi [21]. |
| Metode            | <ul style="list-style-type: none"> <li>• Pengumpulan data menggunakan metode wawancara, pengamatan, tinjauan pustaka, dan dokumentasi.</li> <li>• Analisa data menggunakan teknik analisa data deskriptif kualitatif.</li> <li>• Analisa perhitungan menggunakan <i>mean</i> statistik.</li> <li>• Menggunakan kerangka kerja <i>COBIT 5</i>.</li> <li>• Identifikasi Domain dan Proses <i>COBIT 5</i> menggunakan mekanisme <i>Cascading/mapping COBIT 5</i>.</li> <li>• Perhitungan <i>Maturity Level</i>.</li> </ul>                                                                                          |
| Hasil             | Hasil <i>mapping</i> yaitu berupa <i>sub-Domain APO08</i> [21]. Hasil perhitungan <i>Maturity Level</i> pada <i>sub-Domain APO08</i> adalah sebesar 4,9, sedangkan untuk tiap Proses APO08 adalah [21]: <ul style="list-style-type: none"> <li>• APO08.01 = 4,9</li> <li>• APO08.02 = 4,8</li> <li>• APO08.03 = 4,8</li> <li>• APO08.04 = 4,9</li> <li>• APO08.05 = 4,9</li> </ul>                                                                                                                                                                                                                               |
| Kesimpulan        | <i>Maturity level</i> pada <i>sub-Domain APO08 (Manage Relationship)</i> adalah level 4 ( <i>Managed and Measurable</i> ) yang mana penerapan teknologi informasi telah memiliki ukuran dan sudah dijadikan sebagai sasaran maupun obyektivitas kinerja perusahaan [21]. Tingkat kematangan perusahaan dalam mengelola teknologi informasi sudah pada level <i>best practice</i> [21].                                                                                                                                                                                                                           |
| Apa yang Diadopsi | <ul style="list-style-type: none"> <li>• Kerangka kerja <i>COBIT 5</i>.</li> <li>• Metode <i>Cascading/mapping</i> kerangka kerja <i>COBIT 5</i>.</li> <li>• Pengumpulan data (wawancara, tinjauan pustaka, dan observasi/pengamatan).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                |
| ARTIKEL KEDUA     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Judul Artikel         | <i>Evaluation of Personnel Information System Performance at the Department of Population and Civil Registration of Bengkulu Regency Using COBIT 5</i>                                                                                                                                                                                                                                                                                                                                                       |
| Nama Jurnal           | <i>Journal of Information Systems and Informatics Vol. 1, No. 2, June 2021</i>                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Penulis               | Tania Linda, Agustinus Fritz Wijaya.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Permasalahan          | Dinas Kependudukan dan Catatan Sipil ingin menciptakan nilai yang optimal dari TI, dengan mengoptimalkan tingkat risiko dan penggunaan sumber daya [22]. Maka dari itu diperlukan pengawasan dan evaluasi secara menyeluruh terhadap sistem informasi [22].                                                                                                                                                                                                                                                  |
| Metode                | <ul style="list-style-type: none"> <li>• Pengumpulan data menggunakan metode wawancara, pengamatan, tinjauan pustaka, dan dokumentasi.</li> <li>• Analisa data menggunakan teknik analisa data deskriptif kualitatif.</li> <li>• Menggunakan kerangka kerja COBIT 5.</li> <li>• Perhitungan Tingkat Kapabilitas.</li> </ul>                                                                                                                                                                                  |
| Hasil                 | Hasil perhitungan Tingkat Kapabilitas pada tiap <i>sub-Domain MEA</i> adalah [22]: <ul style="list-style-type: none"> <li>• MEA01 = 2</li> <li>• MEA02 = 2</li> <li>• MEA03 = 2</li> </ul>                                                                                                                                                                                                                                                                                                                   |
| Kesimpulan            | Tingkat kematangan Domain MEA pada level 2, belum mencapai tingkat harapan yaitu pada level 3 [22]. Dinas Kependudukan dan Catatan Sipil perlu meningkatkan dalam pengoptimalan penggunaan SKP agar dapat mencapai tujuan organisasi [22].                                                                                                                                                                                                                                                                   |
| Apa yang Diadopsi     | <ul style="list-style-type: none"> <li>• Kerangka kerja COBIT 5.</li> <li>• Analisa dan evaluasi Domain MEA.</li> <li>• Pengukuran Tingkat Kapabilitas kerangka kerja COBIT 5.</li> <li>• Rekomendasi Domain MEA.</li> </ul>                                                                                                                                                                                                                                                                                 |
| <b>ARTIKEL KETIGA</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Judul Artikel         | COBIT 5: Tingkat Kapabilitas pada PT Supra Boga Lestari.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Nama Jurnal           | Ultima InfoSys: Jurnal Ilmu Sistem Informasi, Vol. 9, No. 1, Hal. 18-23, Tahun 2018.                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Penulis               | Raynard, Wella.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Permasalahan          | PT Supra Boga Lestari Tbk sudah menggunakan teknologi informasi untuk membantu proses bisnisnya, tetapi pengawasan pada kinerja karyawan belum sepenuhnya optimal, serta banyak karyawan yang tidak melaksanakan SOP dengan baik dikarenakan tidak dapat memahami SOP tersebut [23]. Permasalahan lainnya yaitu pada bidang keamanan berupa adanya penyalahgunaan kata sandi, serta terdapat sistem yang tidak saling terhubung secara <i>real time</i> , mengakibatkan kendala dalam proses bisnisnya [23]. |
| Metode                | <ul style="list-style-type: none"> <li>• Menggunakan kerangka kerja COBIT 5 (.</li> <li>• Menggunakan tahapan audit sistem informasi dari Gallegos.</li> <li>• Menggunakan metode Observasi dan Wawancara untuk mendapatkan informasi dan data-data perihal perusahaan.</li> <li>• Menggunakan metode kuesioner</li> <li>• Perhitungan Tingkat Kapabilitas.</li> </ul>                                                                                                                                       |
| Hasil                 | Hasil perhitungan Tingkat Kapabilitas pada Proses terpilih adalah [23]: <ul style="list-style-type: none"> <li>• APO01 = 3</li> <li>• APO02 = 4</li> <li>• APO03 = 3</li> <li>• APO07 = 1</li> <li>• APO08 = 4</li> </ul>                                                                                                                                                                                                                                                                                    |

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | <ul style="list-style-type: none"> <li>• <i>BAI02</i> = 1</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Kesimpulan             | Proses terpilih berdasarkan kerangka kerja <i>COBIT 5</i> adalah <i>APO01</i> , <i>APO02</i> , <i>APO03</i> , <i>APO07</i> , <i>APO08</i> , <i>BAI02</i> [23]. Pada Proses <i>APO07</i> dan <i>BAI02</i> berada pada Tingkat 1, perusahaan baru mulai melaksanakan proses dan tujuan proses TI [23]. Pada Proses <i>APO03</i> dan <i>APO01</i> berada pada Tingkat 3, perusahaan memiliki proses-proses TI yang sudah baik atau matang [23]. Pada Proses <i>APO02</i> dan <i>APO08</i> berada pada Tingkat 4, perusahaan sudah baik atau mapan dalam melaksanakan proses TI dengan terdapat batasan dalam mencapai hasil proses tersebut ke depannya [23]. Rekomendasi yang dibutuhkan seperti (1) menyusun SOP, (2) mengadakan pelatihan yang lebih, (3) menyusun tujuan-tujuan perihal proses bisnis dan kegiatan operasionalnya [23]. |
| Apa yang Diadopsi      | <ul style="list-style-type: none"> <li>• Kerangka kerja <i>COBIT 5</i>.</li> <li>• Tahapan Audit Sistem Informasi.</li> <li>• Pelaksanaan audit secara keseluruhan.</li> <li>• Pengukuran Tingkat Kapabilitas.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>ARTIKEL KEEMPAT</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Judul Artikel          | Audit Sistem Informasi Menggunakan <i>Framework COBIT 4.1</i> Sebagai Upaya Evaluasi Pengolahan Data Pada SMKK BPK Penabur Bandar Lampung                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Nama Jurnal            | Jurnal Ilmiah Infrastruktur Teknologi Informasi (JIITI), Vol. 1, No. 1, Hal. 1-6, Tahun 2020.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Penulis                | Dedi Darwis, Dwi Maila Pauristina.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Permasalahan           | Sistem DAPODIK yang ada pada SMKK BPK Penabur Bandar Lampung belum di audit, maka dari itu diperlukan audit sistem informasi untuk memastikan bahwa sistem DAPODIK sudah sesuai dengan tujuan organisasi dan serta mengantisipasi adanya penyalahgunaan data dalam pengolahan data [24].                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Metode                 | <ul style="list-style-type: none"> <li>• Menggunakan metode Tahapan Audit Sistem Informasi.</li> <li>• Pengumpulan data menggunakan metode wawancara, pengamatan, tinjauan pustaka, dokumentasi, dan kuesioner.</li> <li>• Analisa data menggunakan teknik analisa data deskriptif kualitatif.</li> <li>• Menggunakan kerangka kerja <i>COBIT 4.1</i>.</li> <li>• Perhitungan <i>Maturity Level</i>.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Hasil                  | <p>Hasil perhitungan Tingkat Kematangan pada tiap <i>sub-Domain</i> adalah [24]:</p> <ul style="list-style-type: none"> <li>• <i>DSS05</i> = 2,3</li> <li>• <i>DSS07</i> = 2,2</li> <li>• <i>DSS10</i> = 2,2</li> <li>• <i>DSS11</i> = 2,4</li> <li>• <i>DSS12</i> = 2,0</li> <li>• <i>DSS13</i> = 2,4</li> <li>• <i>MEA01</i> = 2,2</li> <li>• <i>MEA02</i> = 2,3</li> <li>• <i>MEA03</i> = 2,2</li> <li>• <i>MEA04</i> = 2,4.</li> </ul> <p>Untuk hasil kesenjangan pada Domain <i>DSS</i> dan <i>MEA</i> yaitu dengan nilai 0,7 [24].</p>                                                                                                                                                                                                                                                                                             |
| Kesimpulan             | SMKK BPK Penabur Bandar Lampung telah melaksanakan pengolahan data namun belum mengikuti standar yang ada [24]. Untuk <i>sub-Domain DSS12</i> memiliki nilai rata-rata terendah,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                   |                                                                                                         |
|-------------------|---------------------------------------------------------------------------------------------------------|
|                   | dikarenakan belum memiliki prosedur dalam pengolahan data dan informasi, perlu adanya rekomendasi [24]. |
| Apa yang Diadopsi | <ul style="list-style-type: none"> <li>• Metode tahapan Audit Sistem Informasi.</li> </ul>              |

Berdasarkan Tabel 2.1 mengenai empat penelitian terdahulu, dapat diketahui secara garis besar bahwa seluruh penelitian terdahulu menggunakan kerangka kerja *COBIT*, khususnya pada penelitian yang dilakukan oleh Adhie Thyo [21], Tania Linda [22], dan Reynard [23] yang menggunakan kerangka kerja *COBIT 5*, sedangkan untuk penelitian yang dilakukan oleh Dedi Darwis [24] menggunakan *COBIT 4.1*. Pada penelitian Adhie dan Tania tidak terdapat metode tahapan audit, sedangkan pada penelitian Reynard dan Dedi terdapat dan menggunakan tahapan audit yaitu tahapan Audit Sistem Informasi.

Fokus dari penelitian yang dilakukan oleh Adhie [21] adalah berfokus pada Domain *APO*, khususnya pada Proses *APO08*, untuk dilakukan pengukuran Tingkat Kapabilitasnya saja. Pemilihan Proses *COBIT 5* tersebut didapatkan dengan menggunakan mekanisme *cascading*. Pada penelitian selanjutnya yang dilakukan oleh Tania [22] berfokus pada evaluasi Domain *MEA* dengan melakukan pengukuran Tingkat Kapabilitas, Domain tersebut terpilih dikarenakan terdapat permasalahan dan kebutuhan perihal pengawasan atau pemantauan terhadap teknologi informasi pada perusahaan, permasalahan tersebut memiliki kemiripan dengan permasalahan yang ada pada penelitian yang akan dilakukan ini. Penelitian yang dilakukan oleh Reynard [23] berfokus pada pengukuran Tingkat Kapabilitas Domain *APO* dan *BAI*, metodologi yang digunakan menggunakan tahapan Audit Sistem Informasi. Untuk penelitian yang dilakukan oleh Dedi [24] melakukan audit sistem informasi dengan fokus pada pengukuran Tingkat Kematangan Domain *DSS* dan *MEA* dengan menggunakan *COBIT 4.1*, pada penelitian ini juga menggunakan metode tahapan Audit Sistem Informasi.

Berdasarkan pemaparan di atas maka dapat disimpulkan bahwa: (1) penggunaan kerangka kerja *COBIT 5*, metode pengumpulan data, dan metode *Cascading* yang akan digunakan pada penelitian ini berdasarkan atau mengacu pada sumber artikel pertama yaitu penelitian yang dilakukan oleh Adhie Thyo, (2) penggunaan analisa dan evaluasi perihal permasalahan dan kebutuhan berupa pengawasan atau

pemantauan TI, pengukuran Tingkat Kapabilitas, dan rekomendasi yang akan digunakan pada penelitian ini yang mengacu pada sumber penelitian yang dilakukan oleh Tania Linda, (3) pelaksanaan audit secara keseluruhan yang akan digunakan pada penelitian ini yang mengacu pada sumber penelitian yang dilakukan oleh Reynard, dan (4) penggunaan metode Tahapan Audit Sistem Informasi yang akan digunakan pada penelitian ini yang mengacu pada penelitian yang dilakukan oleh Dedi Darwis.

Kebaharuan yang ada dari penelitian yang akan dilakukan jika dibandingkan dengan empat penelitian terdahulu adalah pada objek penelitian yaitu perusahaan BUMN, serta dalam metode audit pada dua penelitian terdahulu tidak ada, sedangkan untuk penelitian yang akan dilakukan oleh peneliti memiliki dan menggunakan metode tahapan Audit Sistem Informasi dari ISACA.

