1

Sustainable warehouse is an important part of SSCM which includes the process of receiving, storing, retrieving and shipping of raw materials, work in process or final products. In sustainable warehouses, companies not only consider financial factors such as ordering costs and holding costs, but also maintain a balance of the warehouse's operational impact on the surrounding social and environment [13]. A balance between economic, social and environmental factors must be maintained because one factor with another can impact each other. For example, there are three types of activities to reduce the environmental impact of warehouse operations, i.e. tree planting, carbon credits and modification of material handling devices. All these activities will increase the warehouse operating costs, so that the allocation of funds for employee training and some other investments will be reduced. The Balanced Scorecard (BSC) is an assessment method that balances four measurement perspectives, i.e. financial perspective, customer perspective, internal business process perspective and learning and growth perspective [14]. Kaplan and Norton have developed nine steps to create and implement the Balanced Scorecard in an organization, i.e. [15]:

Conduct an overall organization estimation.

Identify strategic themes.

Define strategic perspectives and targets.

Develop a strategy map.

Create a performance matrix.

Prioritize initiative strategies.

Communicating strategy.

Implement Balanced Scorecard.

Collect data, evaluate and make improvements

2

Balanced Scorecard is the strategic management tool which employs performance metrics from financial, customer, internal processes, and growth perspectives. By combining these different perspectives, BSC helps managers to understand the inter-relationships and trade-offs between alternative performance dimensions, thus leading to improved decision making and problem-solving. The use of a balanced scorecard helps in examining all the areas in Halal warehouse operations that may affect results and it can also help in improving efficiency and effectiveness in warehouse operations management, thus promoting better structure, management and success. Competitive strategy and the BSC has been shown to have a significant relationship in an organizational’s performance [7], which indicated that the BSC has been well accepted as a reliable tool for business operations. Still, the difficulty in the implementation of BSC is the identification of strategies that represent the most critical performance aspects of corporate operations [8]. The BSC is used in this research because it can be an ideal tool for warehouse organizations to assess and measure their Halalan-Toyyiban culture. Rather than giving a measure of only the incidents and non-compliance statistics that a warehouse might have, the BSC attempts to provide a holistic and value-based balanced report, not only as a performance measurement exercise and but also as a management tool to describe, communicate and implement strategy [9].

平衡记分卡是战略管理工具，它使用财务、客户、内部流程和增长角度的绩效指标。通过结合这些不同的观点，BSC 帮助管理者了解替代绩效维度之间的相互关系和权衡，从而改进决策和解决问题。使用平衡记分卡有助于检查清真仓库运营中可能影响结果的所有领域，也有助于提高仓库运营管理的效率和效力，从而促进更好的结构、管理和成功。

Balanced Scorecard is the strategic management tool which employs performance metrics from financial, customer, internal processes, and growth perspectives. By combining these different perspectives, BSC helps managers to understand the inter-relationships and trade-offs between alternative performance dimensions, thus leading to improved decision making and problem-solving. The use of a balanced scorecard helps in examining all the areas in Halal warehouse operations that may affect results and it can also help in improving efficiency and effectiveness in warehouse operations management, thus promoting better structure, management and success. Competitive strategy and the BSC has been shown to have a significant relationship in an organizational’s performance [7], which indicated that the BSC has been well accepted as a reliable tool for business operations. Still, the difficulty in the implementation of BSC is the identification of strategies that represent the most critical performance aspects of corporate operations [8]

The BSC is used in this research because it can be an ideal tool for warehouse organizations to assess and measure their Halalan-Toyyiban culture. Rather than giving a measure of only the incidents and non-compliance statistics that a warehouse might have, the BSC attempts to provide a holistic and value-based balanced report, not only as a performance measurement exercise and but also as a management tool to describe, communicate and implement strategy [9]

According to the Theory Of Constraints (TOC), every activity is strictly bounded to the others in a complex system. It could be possible to estimate system performances by analyzing a few factors that should have a waterfall effect on the whole system (Goldratt, 1990). Moreover, focusing on a defined set of key indicators allows for avoiding information overflow (Tangen, 2004). A performance evaluation system should be layered in different levels linked with the hierarchical organization levels (Cross & Lynch, 1988) in order to align the objectives of different business functions, stimulate concurrent activities, and ensure a link between the strategic vision and operations (Cross & Lynch, 1988), (Tangen, 2004).

根据约束理论（TOC），每个活动都严格地局限于复杂系统中的其他活动。通过分析一些应该对整个系统有瀑布效应的因素（Goldratt，1990年），可以估计系统性能。此外，侧重于一组确定的关键指标可以避免信息溢出（Tangen，2004年）。绩效评估系统应分层到与等级组织级别（Cross & Lynch，1988 年）相关的不同级别，以便调整不同业务职能的目标，刺激并发活动，并确保战略愿景和运营之间的联系（Cross & Lynch，1988 年），（Tangen，2004 年）。

Balance Scorecard (BSC), developed from the idea in (Kaplan & Norton, 1996), is one of the first model proposed with the goal of representing the efficiency and effectiveness of activities inside a complex organization. The logic behind BSC is that a single type of indicator cannot represent a company's economic results. It is, therefore, necessary to provide intermediate indicators in addition to the economic ones. The BSC method aims to analyze results balancing different perspectives: financial focus, customer focus, internal business process focus, and learning/growth focus. The main aim of this paper to discover which are the main performance indicators for an automated warehouse.

[BSC](https://baike.baidu.com/item/BSC/429471)即平衡计[分卡](https://baike.baidu.com/item/%E5%88%86%E5%8D%A1)（Balanced Score Card），是常见的绩效考核方式之一，平衡计分卡是从财务、客户、内部运营、学习与成长四个角度，将组织的战略落实为可操作的衡量指标和目标值的一种新型绩效管理体系。

**一、财务面**

财务性指标是一般企业常用于绩效评估的传统指标。财务性绩效指标可显示出企业的战略及其实施和执行是否正在为最终经营结果（如利润）的改善作出贡献。但是，不是所有的长期策略都能很快产生短期的财务盈利。非财务性绩效指标（如质量、生产时间、[生产率](https://baike.baidu.com/item/%E7%94%9F%E4%BA%A7%E7%8E%87)和新产品等）的改善和提高是实现目的的手段，而不是目的的本身。财务面指标衡量的主要内容：收入的增长、收入的结构、[降低成本](https://baike.baidu.com/item/%E9%99%8D%E4%BD%8E%E6%88%90%E6%9C%AC)、提高生产率、资产的利用和投资战略等。

**二、客户面**

平衡计分卡要求企业将使命和策略诠释为具体的与客户相关的目标和要点。企业应以目标顾客和目标市场为导向，应当专注于是否满足核心[顾客需求](https://baike.baidu.com/item/%E9%A1%BE%E5%AE%A2%E9%9C%80%E6%B1%82)，而不是企图满足所有客户的偏好。客户最关心的不外于五个方面：时间，质量，性能，服务和成本。企业必须为这五个方面树立清晰的目标，然后将这些目标细化为具体的指标。客户面指标衡量的主要内容：[市场份额](https://baike.baidu.com/item/%E5%B8%82%E5%9C%BA%E4%BB%BD%E9%A2%9D)、老客户挽留率、[新客户获得率](https://baike.baidu.com/item/%E6%96%B0%E5%AE%A2%E6%88%B7%E8%8E%B7%E5%BE%97%E7%8E%87)、[顾客满意度](https://baike.baidu.com/item/%E9%A1%BE%E5%AE%A2%E6%BB%A1%E6%84%8F%E5%BA%A6)、从客户处获得的利润率。

**三、内部营运面**

建立平衡计分卡的顺序，通常是在先制定财务和客户方面的目标与指标后，才制定企业内部流程面的目标与指标，这个顺序使企业能够抓住重点，专心衡量那些与股东和客户目标息息相关的流程。内部运营绩效考核应以对客户满意度和实现财务目标影响最大的业务流程为核心。内部运营指标既包括短期的现有业务的改善，又涉及长远的产品和服务的革新。内部运营面指标涉及企业的改良/创新过程、经营过程和售后服务过程。

**四、学习与成长面**

学习与成长的目标为其他三个方面的宏大目标提供了基础架构，是驱使上述计分卡三个方面获得卓越成果的动力。面对激烈的全球竞争，企业今天的技术和能力已无法确保其实现未来的业务目标。削减对企业学习和成长能力的投资虽然能在短期内增加财务收入，但由此造成的不利影响将在未来对企业带来沉重打击。学习和成长面指标涉及员工的能力、信息系统的能力与激励、授权与相互配合。

更进一步而言，平衡计分卡的发展过程中特别强调描述策略背后的因果关系，借客户面、内部营运面、学习与成长面评估指标的完成而达到最终的财务目标。

平衡记分卡是战略管理工具，它使用财务、客户、内部流程和增长角度的绩效指标。财务性指标是一般企业常用于绩效评估的传统指标，客户面指标在仓库系统中主要衡量的是客户满意度，内部运营绩效考核以对客户满意度和财务目标有影响的业务流程为核心。学习与成长的目标为其他三个方面的宏大目标提供了基础架构，是驱使上述计分卡三个方面获得卓越成果的动力。通过结合这些不同的观点，BSC 帮助管理者了解替代绩效维度之间的相互关系和权衡，从而改进决策和解决问题。

The Balanced Scorecard is a strategic management tool that uses performance indicators from a financial, customer, internal process, and growth perspective. Financial indicators are the traditional indicators commonly used by general enterprises for performance evaluation, customer face indicators. The main measure in the warehouse system is customer satisfaction, and internal operational performance appraisal is centered on business processes that have an impact on customer satisfaction and financial objectives. The goals of learning and growth provide the infrastructure for the grand goals of the other three areas and are the driving force behind the superior results in the three areas of the scorecard above. By combining these different perspectives, BSC helps managers understand the interrelationships and trade-offs between alternative performance dimensions to improve decision-making and problem solving.