

# Transformation to INDI 4.0 by Measuring Rewards Effect Through Entrepreneurial Orientation in the Manufacturing Firm

<sup>a</sup>Neven Halim Sutanto, <sup>a</sup>Beni Widarman Yus Kelana, <sup>b</sup>Togar M. Simatupang

<sup>a</sup>Azman Hashim International Business School, Universiti Teknologi Malaysia, Johor, Malaysia, <sup>b</sup>School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia

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## Abstract

This article aspires to review the factors influencing the organizational performance of Indonesian manufacturing firms about their readiness for the transformation into the Industrial Revolution (IR) 4.0 era. The study proposes a framework based on the classic VIE (Valence-Instrumentality-Expectancy) framework, which is also popularly known as the Expectancy Theory to magnify the performance of the firms in terms of technology adoption. Previous research indicates that both rewards and entrepreneurial orientation (EO) significantly impact firm performance. However, some studies suggest that in certain conditions, not all dimensions in the rewards practice and EO behaved as the significant predictors. From the previous studies investigation, several research gaps regarding field issues, theoretical issues, and models have been recognized. First, organizations and human resources in Indonesian firms show relatively low readiness to adapt to the Industry 4.0 environment, particularly in the topics of the innovation of new products and the efficiency of production. Second, there is a lack of thorough exploration of reward systems in both field implementation contexts and academic study. Third, the relationship between rewards and organizational performance, which is mediated by EO, deserves more attention. Lastly, the independent components of rewards (financial and non-financial) and their relationship with entrepreneurial orientation as a multidimensional construct, remains unexplored. A quantitative research approach will be employed, utilizing an online questionnaire survey that will be distributed to 300 manufacturing firms in the textiles industry in West Java Province of Indonesia. The data analysis will be done by utilizing Partial Least Squares – Structural Equation Modelling (PLS-SEM).

**Keywords:** INDI 4.0, Financial Rewards, Non-Financial Rewards, Manufacturing, IR4.0, Entrepreneurial Orientation, Performance.

## Introduction

The pursuit to stimulate existing industries' productivity and generate sustainable growth moment is the core attention of any industrial revolution. Within the framework of Industry 4.0 revolution, not only will the production process be impacted, but other critical aspects of business processes will also come into play. Specifically, product innovation and development are key. Exploring management approaches and organizational impact in depth is essential for successfully navigating Industry 4.0. While most research on the latest industrial revolution focuses on technical aspects, there's a noticeable lack of attention to the managerial perspective (Mohelska and Sokolova, 2018). Despite being recognized as crucial, human resources remain understudied. Understanding organizational roles is essential for the effective transformation into Industry 4.0, and achieving expected achievement for business organizations (Mohelska and Sokolova, 2018). Industry 4.0 demands a committed strategy formulation, considering the adaptation period during organizational changes and various facets (Piccarozzi et al., 2018). Thus, the attention to adopt Industry 4.0 by the human resources management and organizational point of view lies in fostering continuous innovation and learning capabilities.

A 2014 survey by the McKinsey Productivity Sciences Center found that 15% of ASEAN respondents were confident about the potential of novel technologies to boost predicting precision, leading to enhanced revenue and efficiency. While ASEAN already serves as a significant manufacturing hub, leveraging distracting technologies like Internet of Things (IoT) and Artificial Intelligence (AI) is critical to drive substantial growth in the sector. Despite this, many manufacturing firms in ASEAN have been slow to adopt the latest technologies in their businesses. Indonesia achieved considerably low for technology implementation readiness, scoring 3.9 out of 5 in technological readiness (Schwab, 2018). In the **INDI 4.0 assessment**, conducted by Indonesia's Ministry of Industry, 326 cross-sector companies were evaluated to gauge their readiness for the latest technologies. The average score of readiness was **2.14 out of 4.0**, indicating that substantial efforts are still required to meet Industry 4.0 criteria. Specifically, in terms of **management and organization readiness**, the average score was **2.12**.

This research aims to develop a scheme using a management studies perspective, focusing on the character of **EO** in companies transitioning to Industry 4.0. EO is frequently quoted as a firm's tendency to take risks, innovate, and proactively seek opportunities. By analyzing this orientation, researchers hope to uncover insights that can enhance firms' performance during the Industry 4.0 transformation. Moreover, the study will investigate the **relevance of rewards** in the Industry 4.0 environment. Rewards play a crucial role in motivating employees and shaping their behavior. Understanding how rewards align with the demands of Industry 4.0 can provide valuable guidance for firms. Previous research on rewards and organizational performance in Indonesia primarily focused on sectors such as agriculture, service, and academia. By examining manufacturing firms, this study aims to fill the gap and shed light on how rewards and EO impact firm performance in the domain of Industry 4.0.

## Concepts and Definitions

This study mainly discusses the phenomena in the framework that consists of some dimensions of the variables (financial rewards, non-financial rewards, innovativeness, risk-taking, and proactiveness).

## **Theoretical Foundations**

### **Rewards**

Rewards encompass specific financial compensations, objects, or events which the talents accept in exchange for their efforts or achievements (Suri, 2016). These rewards serve as motivators, encouraging employees to perform tasks because the work itself is intrinsically rewarding and provides a pleasurable experience. There are two primary interpretations of rewards:

1. Extrinsic rewards: These are external incentives, typically financial, provided by employers. They play a vital role in attracting and retaining individuals within an organization.
2. Intrinsic rewards: These non-financial rewards, e.g., work experience, learning, and development, increase the effect of monetary compensation. They contribute significantly to employees' motivation (Deci and Ryan, 2000).

The concept of total reward, introduced in 1990 Sedlak (2015), takes a comprehensive technique to work-related incomes. According to WorldatWork (2000), total rewards fall into three categories: compensation, benefits, and work experience. Additionally, Brown and Armstrong (1999) propose a structure that differentiates below rewards:

- Transactional rewards: These financial rewards are essential for employee recruitment and retention. While they can be imitated by competitors, they remain crucial.
- Relational rewards: These non-financial rewards complement transactional rewards, adding value through aspects like work experience and personal development.

In summary, modern organizations structure their reward systems around two main categories: financial and non-financial rewards, each playing a pivotal part in employee satisfaction and performance (Armstrong and Murlis, 2007).

In general, employees' inclination toward entrepreneurship tends to develop only when they perceive adequate compensation (Baskaran et al., 2018). Employees seek acknowledgment for their active involvement and exceptional entrepreneurial accomplishments. However, Moghaddam (2017) contends that incentives may not significantly affect decision-making when faced with latest work challenges. Salvato (2004) discovered a positive correlation between incentive programs that reward employees and their entrepreneurial mindset. Entrepreneurship literature suggests that companies should establish a compensation structure that considers individual responsibility, priorities, and results-based incentives to foster entrepreneurial thinking among employees. These incentives can take various forms, including monetary rewards, rank, influence, career growth, and psychological motivators like self-realization and social recognition (Morris and Kuratko, 2002). A review by Kuratko et al. (2004) emphasizes the significance of effectively using rewards to activate entrepreneurial orientation in employees (Barringer and Milkovich, 1998; Covin and Miles, 1999; Kuratko et al., 2001). This finding aligns with expectancy theory, which explains the relationship between expectations, goal attainment, and entrepreneurial outcomes (Barba-Sánchez and Atienza-Sahuquillo, 2017).

### **Entrepreneurial Orientation (EO)**

Entrepreneurial Orientation is described as a construct that assesses how innovative, risk-taking, and proactive firms are reflected in behaviors, implementations, and decision-making (Miller, 1983). Edwards (2014) defines EO as the integration of procedures, implementatio,

and decision-making styles with entrepreneurial traits. Entrepreneurial orientation has received substantial attention in organizational behavior literature and is widely recognized as a key concept in entrepreneurship (Gupta and Batra, 2016). Among various entrepreneurial topics, EO stands out due to its well-established academic published works (Covin and Lumpkin, 2011; Wales et al., 2011).

According to Ireland et al (2009), entrepreneurial orientation serves as an indicator of a company's status, characterized by various behavioral dimensions. The literature predominantly discusses two perspectives: a single-dimensional approach, initially initiated by Miller (1983), and a multidimensional perspective, often correlated with the framework postulated by (Lumpkin and Dess, 1996). The single-dimensional perspective, as outlined by Covin and Slevin (1989); Miller (1983), assesses EO based on three main aspects: innovativeness, risk-taking, and proactiveness. In contrast, the research by Lumpkin and Dess (1996) expands upon these dimensions by adding autonomy and competitive aggressiveness, proposing a multidimensional construct. Subsequent studies conceptualized entrepreneurial orientation as a multidimensional construct that comprised of entrepreneurial efforts (innovativeness and proactiveness) and risk-taking control, emphasizing the coexistence of both dimensions for EO viability (Anderson et al., 2015). The understanding of entrepreneurship within organizational contexts has evolved significantly since Miller's influential work 1983. Rauch et al (2009), in their exploration of the literature, concluded that EO significantly drives organizational performance. Despite certain limitations in establishing this connection, the literature consistently highlights the theoretical and practical relevance of EO (Andersén, 2010).

### **Organizational Performance (OP)**

Organizational Performance (OP) refers to how well a business entity utilizes its available resources to achieve its objectives while maintaining relevance to customers (Taouab and Issor, 2019). It encompasses the efficient management of resources to meet organizational goals. OP plays a crucial role in deciding why some firms succeed while others fail (Adam, 2018). Entrepreneurs, managers, and executives must assess their firm's achievement level to drive required improvements, as OP significantly impacts competitiveness. Indicators such as profitability, return on investment (ROI), return on equity (ROE), and return on assets (ROA) are commonly used (Lo et al., 2016). Additionally, growth is a vital performance indicator, especially for small and medium-sized firms (Wiklund, 1999). However, contemporary evaluations consider non-financial factors like customer satisfaction, employee engagement, supplier relationships, and community impact (Mohd Harif et al., 2012).

In the context of manufacturing firms, operational performance (OP) can be operationalized using three key indicators recommended by (Zack et al., 2009). These indicators serve as the starting points for competitive advantage:

1. **Customer Intimacy:** This indicator focuses on competition based on customer satisfaction and retention levels.
2. **Product Leadership:** Product leadership pertains to innovation in products and services, serving as the foundation for competitive success.
3. **Operational Excellence:** Operational excellence is determined by the efficiency value derived from internal processes.

Given the study's focus on addressing the lack of innovation in products and services, as well as the lack of compliancy for Industry 4.0 transition in Indonesian manufacturing companies, the assessment of OP will center around these three indicators proposed by (Al-Tit, 2017). These indicators collectively represent a single construct of organization-level performance. Notably, researchers such as Ramayah et al (2011); Harif et al (2012); Chien (2014) advocate for a comprehensive examination that considers both financial and non-financial performance indicators.

## Research Model

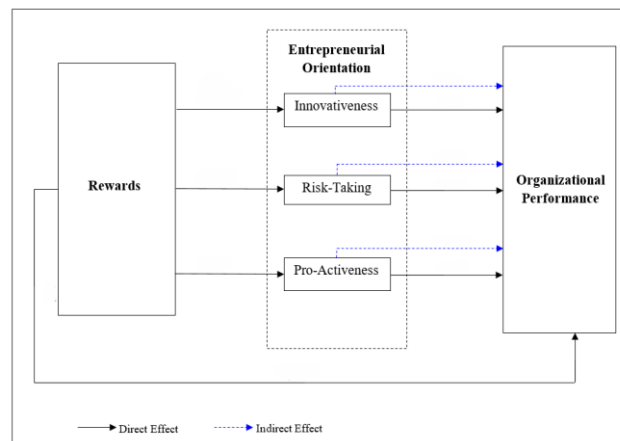


Figure 1 The proposed model

## Conclusion

As the conclusion, this study reached its aim to propose a framework model using EO to enhance the relation of rewards and the firm performance in the transition into Industry 4.0 technologies, among manufacturing industries in Indonesia. The developed framework model was grounded on a systematic literature research aimed at identifying and addressing theoretical and practical gaps. The new framework involving EO is designed to increase the adaptation rate of INDI 4.0 in Indonesian manufacturing firms. As a conceptual paper, it provides a comprehensive overview of the influencing factors and their relationships to new technology adoption among manufacturing firms in Indonesia.

## Contribution and Recommendation

Theoretically, this research will incorporate new insights from recent literature on rewards, entrepreneurial compensation and their interaction with firm performance. Moreover, this study introduces the postulation of entrepreneurial orientation as a multidimensional mediator in the middle of each element of the total reward system and organizational performance. The framework model, developed from past and current studies by prominent scholars, is not only applicable and practical for manufacturing firms in Indonesia, but can also be utilized by academicians, practitioners, non-governmental organizations, and the policy makers in governmental institution. This model can be implemented in INDI 4.0 blueprints to enhance and integrate technology into manufacturing firms management and the overall industrial system.

### Limitations and Suggestions for Further Research

This study focuses on a single group: textiles manufacturing firms in Indonesia. Future research should consider examining other sectors of manufacturing and industry. Additionally, expanding the study to include other context would help broaden the scope and applicability of the findings.

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