

THE GLOBAL TREND ANALYSIS OF HYBRID-DUAL TAG USAGE FOR LOGISTICS SYSTEM

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ABSTRACT. *In this paper, the global needs of the hybrid-dual tag have been surveyed by the statistical methodology especially regarding to the general customer, distribution, and logistics system. The servicing data such as product information, cost, chasing mechanism, have been required in a new device such as hybrid-dual tag applying for the new business expansion.*

Keywords: Hybrid-dual tag, RFID, NFC, Logistics system

1. Introduction. The more efficient techniques for distribution and logistics data service, which are interfaced with the existing devices, have been required in the related industries. It is also needed for supporting the servicing techniques in the product management and product information in the field [1]. The design, technical development, information architecture, and reliability of data servicing issues are to be one of the greatest challenges which the logistics, distribution and customer face today [2].

One such technical development certain to address solving current issues can be the hybrid-dual tag, which must have supported the reliability to general customers, distributors, and logistic companies regarding to market expansion. Hence, the hybrid-dual tag has been imposed to as a new device combined RFID and NFC, calls for the consideration and inclusion of new device attributes satisfying all their requirements [3,4].

Furthermore, logistics system has been recently promoted in many industries as a response to competitive marketing pressures. Viewed as a more systematic approach of creating high quality products' information and bringing them to market at lower cost and in significantly less time, it also attracts the attention of quality designers [5].

2. Global Logistics System. As manufacturers have expanded into new global market, dramatic changes have occurred in recent years. With this opportunity it has come the challenge of intensified competition. Competitive pressures are forcing manufacturing companies to improve customer service, speed up operations and reduce operating costs, especially material flow concepts such as logistics [6].

Customer service covers a range of traditional issues such as order fill rate, on-time delivery, and damage claims. However, the customers want increasingly a range of additional services. In the next few years, manufacturers will have to provide automatic customer inventory replenishment, as well [7].

Despite increasing service demands, manufacturers are also under pressure to reduce the time it takes for their operations. They are seeking shortened order cycle times, greater utilization of truck carriage rather than rail, direct store deliveries, direct plant shipments,

shorter manufacturing run times, more frequent raw material deliveries. Therefore, companies have to rethink their strategy and reengineering their business to be more competitive, responsive, and more profitable [8]. Hence, there are few points which logistic system should have been focused on the more efficient management.

2.1. Increasing responsiveness. One strategic approach many companies take is to increase the ability of their organization to react to change, which is Just-in-time/Quick Response. Their focus is pretty similar to as the time to perform certain activities should be reduced, for example, RFID, NFC, and EDI for applying to raw material data.

2.2. Limitation of JIT/QR. The basic problem to apply those techniques can be frequently changing demand quantity and diversification. For example, material suppliers especially packaging material vendors often cannot respond quickly to unexpected production changes. Flexible scheduling against demand changes should be built.

2.3. The supply chain as an integrated enterprise. Here, link between demand and supply plan across chain is a necessary complement to a JIT/QR environment. Planning should be done in an integrated system where all operations planners see the effects of their plans across the enterprise. Well, the change is a way of life – but the ability to respond to change requires planning in all.

2.4. Enterprise logistics planning systems. Making the different locations more responsive and coordinating the planning function is critical for success. There may be more factors that we can think about; however, these system can be implemented in a relatively short time and may provide significant benefits.

2.5. Demand planning. Demand planning, in other words, the forecasting, is the starting point and most critical element of an integrated logistics plan. It begins with a forecast of SKU (Stock Keeping Unit) demand at the final delivery points in the supply chain of customer, regional market zone or sales district. All information such as correctives and efficiency of the given information can be a key requirement for the demand planning.

2.6. Inventory and distribution planning. DRP (Distribution Resource Planning) converts SKU demand and inventory levels into net requirements, and then calculates when replenishment shipments need to arrive. It can be planned for the next several months. Typically, the process involves analysis of weekly DRP requirements, production capacities and planned materials availabilities to develop feasible weekly production plans.

2.7. Material requirements planning. Planning materials over a horizon longer than visible at the plants, planning blanket purchases order and future contracts, and planning the flow of products in a vertically integrated manufacturing process must have been the important factors to be successful in the logistics systems.

2.8. Deployment and transportation planning. Visibility into planned movements across the supply chain should permit transportation planning opportunities to combine movements to achieve more speed, increased reliability and reduced costs.

2.9. Implementing enterprise logistics planning. Companies need to be able to close the loop their operations plans to ensure that a single plan is driving the business. Communication between functional groups should become a critical necessity, and time lines and time fences are important for decision making. For example, the integration of demand planning, distribution planning and manufacturing planning is crucial to ensure the customer requirements [9].

2.10. **Enterprise-wide focus is critical.** Meeting the tough customer requirements in the twentieth centuries with reducing operating cost is not easy undertaking, since they have to make change, and adjust & accommodate rapid changes. It can be simply stated that the JIT/QR is one of the programs for accomplishing the planning. The integrated logistic planning as well as an enterprise-wide logistics should be developed in a professional manner with an object with industrial engineering focus [10].

3. **Questionnaire Research.** The objectives of this research have been the followings such as identifying the potentiality of the hybrid-dual tag application to their market expansion, and of the related industries. The survey methodology studies the sampling of individual units from a population and the associated survey data collection techniques such as questionnaire construction.

In this paper, the statistical surveys have been undertaken by questionnaire format with a view towards making statistical inferences about market research surveys which can be categorized into distributors, logistics, and end users. The few main factors such as easy application, extension, and cost considerations have been weighted and surveyed [11].

The target population has been ranged from the general population to specific groups of business to identify the accuracy and internal consistence. The survey involves a number of decisions about RFID/NFC to its users, which can provide a quantitative measures.

The statistical analysis has been also explored to identify the application of hybrid-dual tag, and survey data analysis, especially focusing on the distribution and logistics systems. It is also needed to support the product information such as chasing product issues, compatibility, and tag cost.

Although there have been so many results coming out, the recognition of RFID/NFC from the related industries, business expansion factors, cost considerations, market extension, the needs of the hybrid-dual tag, use of RFID/NFC simultaneously, company size, the reason of use/unuse of the RFID or NFC, and the potential buying of the hybrid-dual tag, etc., have been surveyed for three categories [12-14].

Hence, the global trends of system and/or product of hybrid-dual tag have been explored in the needed sections, done by more than three hundreds business. The analysis is evaluated by the statistical methods, especially regarding to the potential and economical view [15].

4. **Survey Analysis.** Survey questionnaires are performed into three sections such as customer, distribution, and logistics; however, the customers' intents to use a new device, hybrid-dual tag, for their business expansion and market extension is focused [16,17]. Here, the customers are customer as end users, distribution as distributors, and logistics as transporting companies, with which are more than three hundreds companies.

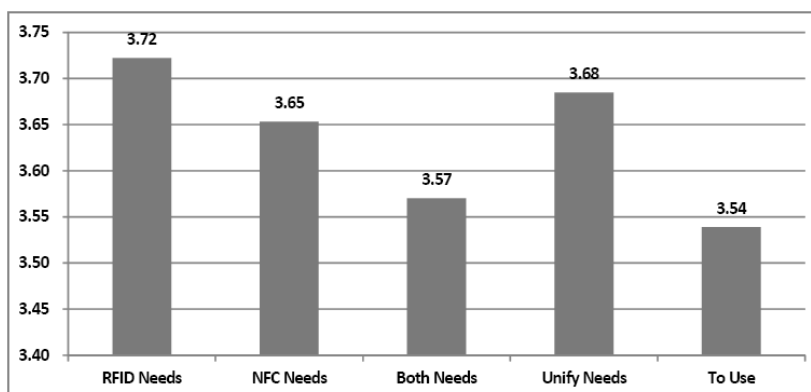


FIGURE 1. Recognition of RFID/NFC needs

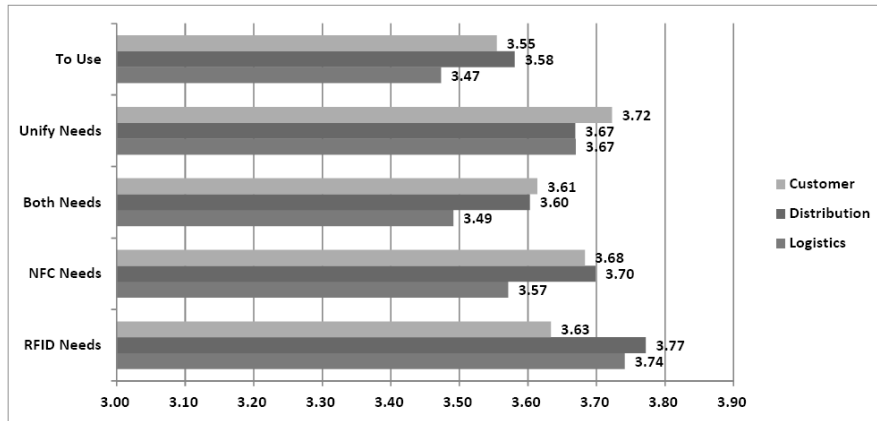


FIGURE 2. Industrial needs of RFID/NFC

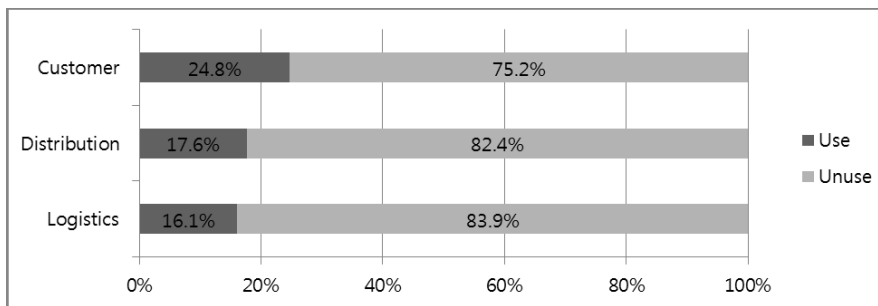


FIGURE 3. NFC using status

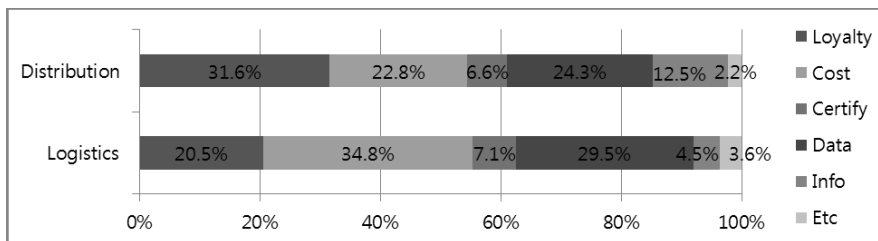


FIGURE 4. Business expansion factors

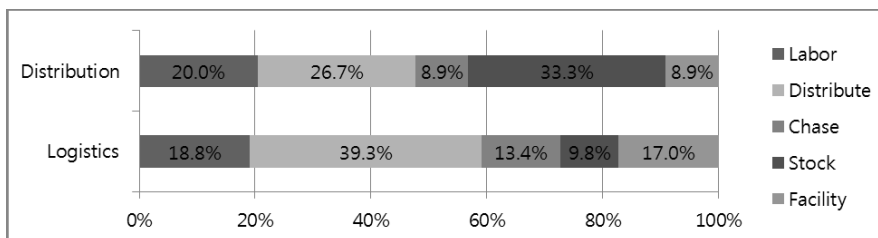


FIGURE 5. Cost down factors

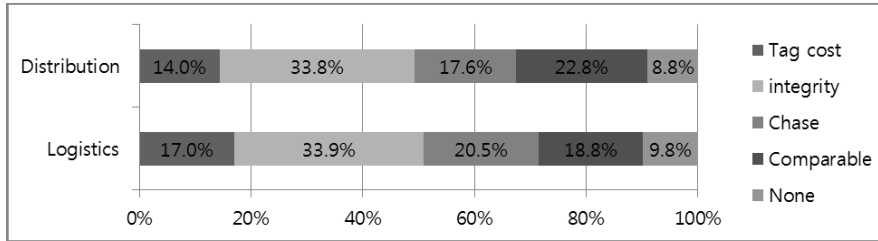


FIGURE 6. Market extension factors

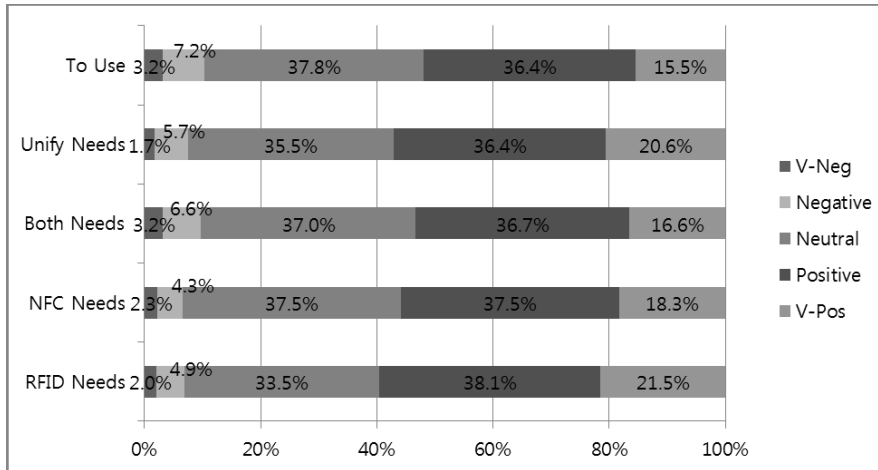


FIGURE 7. Global needs of hybrid-dual tag

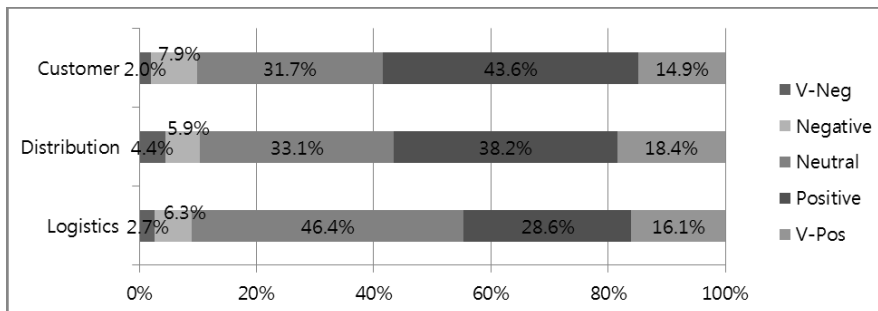


FIGURE 8. Needs of RFID/NFC simultaneously

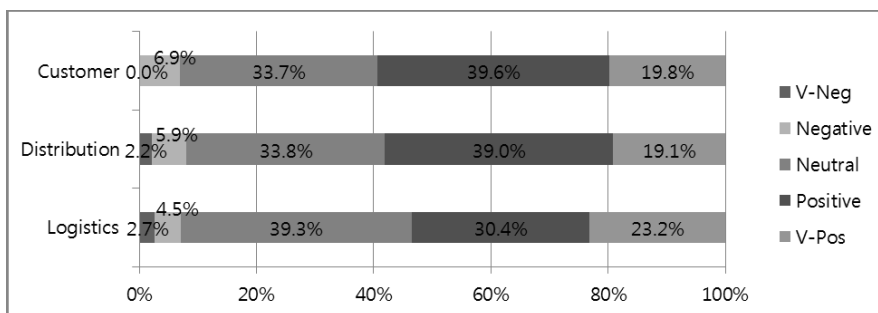


FIGURE 9. Industrial needs of hybrid-dual tag

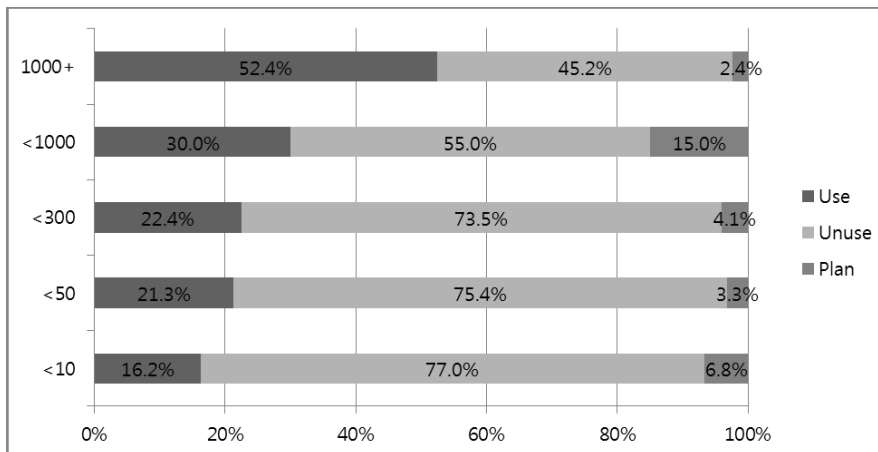


FIGURE 10. RFID used by companies

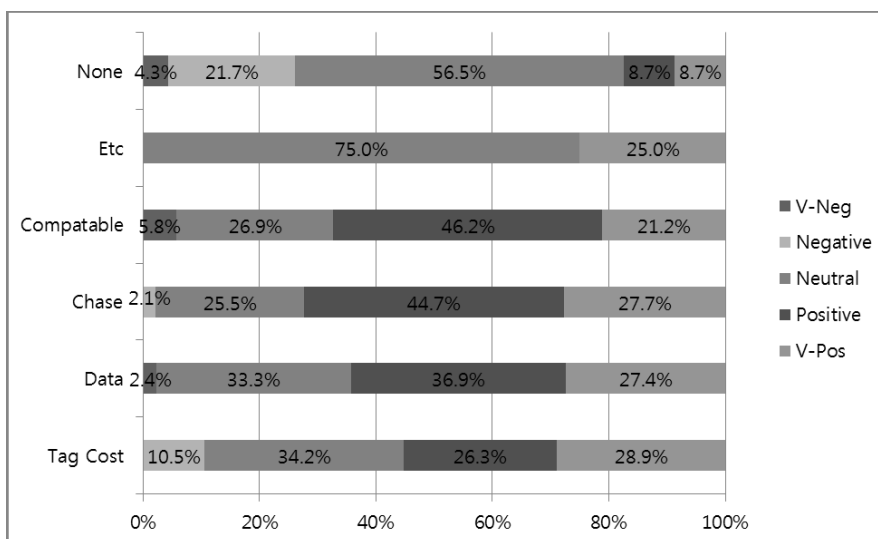


FIGURE 11. Needs of RFID by factors

Figure 1 shows the recognition of RFID/NFC needs to users, Figure 2 as Industrial needs of RFID/NFC to users such as customer, distribution, and the logistics companies, Figure 3 as the current NFC using status to users, Figure 4 as business expansion factors such as loyalty, cost, certify, data usage, information, and etc. to the distribution and logistics companies.

Figure 5 shows the cost down factors such as labor, distribute, chase stock and facility, Figure 6 as the market extension factors such as tag cost, integrity, chase, compatible, and none to the distribution and logistics companies only.

Figure 7 represents the global needs factors of Hybrid-dual tag usage, Figure 8 as needs of RFID/NFC simultaneously to the customer, distribution and logistics companies. Figure 9 as industrial needs of Hybrid-dual tag, Figure 10 as RFID used by company based on the usage and planning to use.

Figure 11 shows the needs of RFID, Figure 12 as the needs of NFC by the given factors, Figure 13 as the factors of un-using RFID, and Figure 14 as the factors of un-using reasons NFC because of the price, application, useless, management to the distribution and logistics companies.

Figure 15 shows the reasons of hybrid-dual tag, Figure 16 as the reasons of RFID/NFC simultaneously, Figure 17 as the potentiality of using hybrid-dual tag, and Figure 18 as the factors of cost consideration by the given factors. Figure 19 represents the factors of

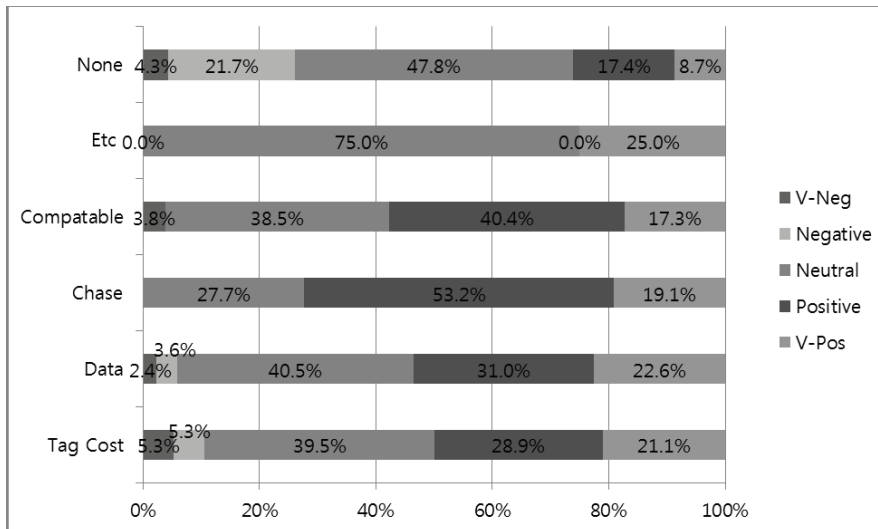


FIGURE 12. Needs of NFC by factors

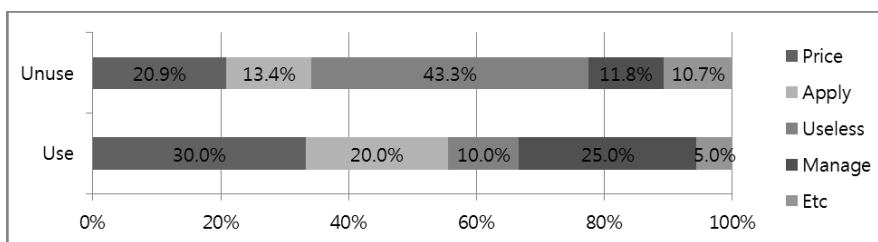


FIGURE 13. Factors of un-using RFID

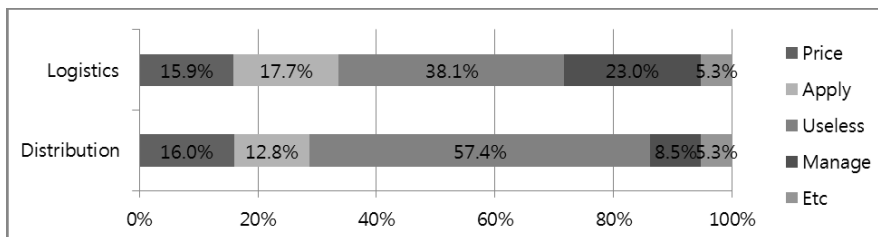


FIGURE 14. Factors of un-using NFC

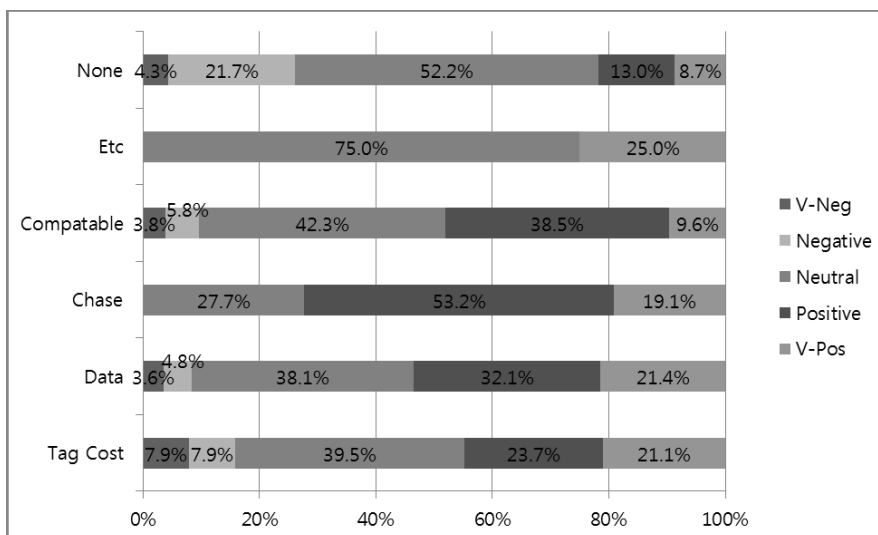


FIGURE 15. Reasons of hybrid-dual tag

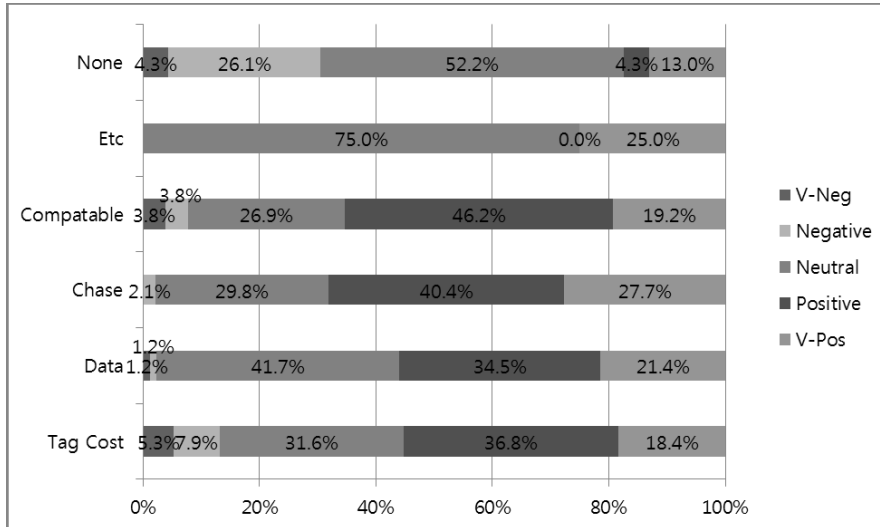


FIGURE 16. Reasons of RFID/NFC simultaneously

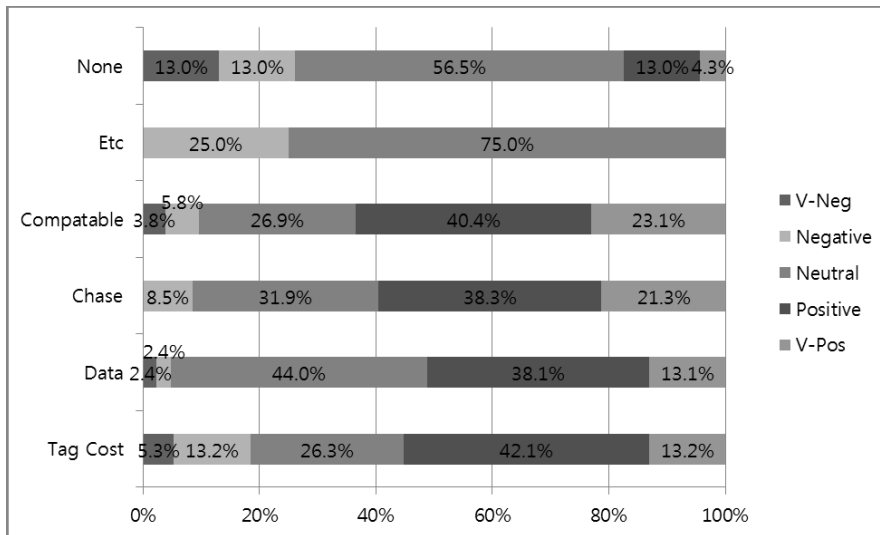


FIGURE 17. Potentiality of using hybrid-dual tag

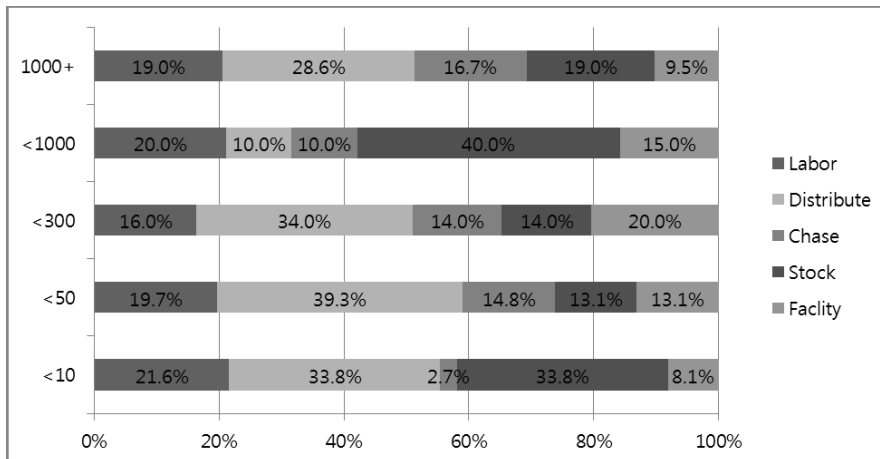


FIGURE 18. Factors of cost consideration

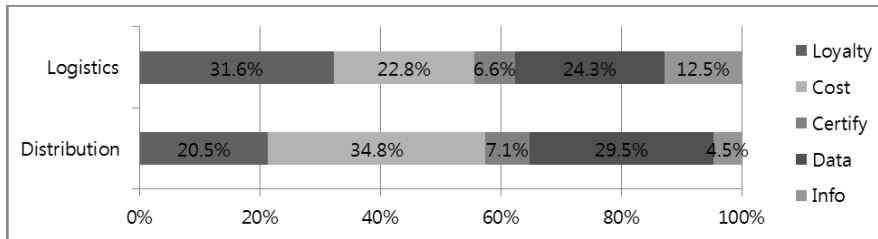


FIGURE 19. Factors of business expansion

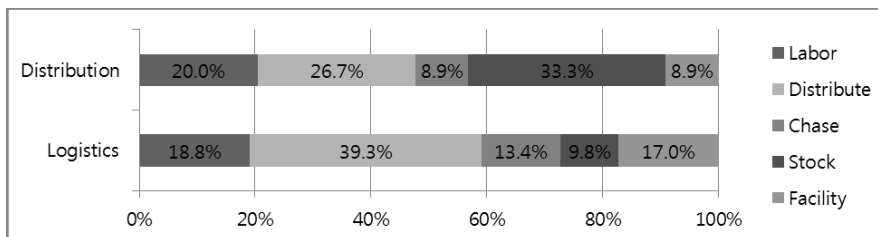


FIGURE 20. Cost down factors

business expansion and Figure 20 as the cost down factors to the distribution and logistics companies only.

5. Conclusions. In this paper the global needs of the hybrid-dual tag have been surveyed by the statistical methodology especially regarding to the general customer, distribution, and logistics system. The intent of using a new device, hybrid-dual tag, to expand their business and marketing has been surveyed and analyzed statistically.

The needs of the hybrid-dual tag from the demanding points are to be recognized; however, the requirements for expanding their business and for extending their marketing have been explored regarding to the device cost, chasing the product and product information, integrated devices, simultaneous use of RFID and NFC, compatibility, stock, facility, data service, etc. The results show that the larger logistics companies are demanding those technical developed devices for more efficient logistics management.

Although the market of hybrid-dual tag looks promising, the more technical demands points are still to be explored and developed with a view point of satisfying the customers, distributors, and logistics companies.

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