



## International Journal of Applied Business and Economic Research

ISSN : 0972-7302

available at <http://www.serialsjournal.com>

© Serials Publications Pvt. Ltd.

Volume 15 • Number 20 • 2017

## Integrated Marketing Communication: Use Information Technology Connect three Dyad Relationships

Po Shun Chen<sup>1\*</sup> and Pao Chia Huang<sup>2</sup>

<sup>1</sup> Assistant Professor of Dept. of Marketing and Logistics Management of Chaoyang University of Technology

<sup>2</sup> Senior Manager of Director of Cloud Service Division of ACloud Intelligent Service Corp.

**Abstract:** Integrated marketing communication (IMC) is an important aspect of information communication. This study uses marketing innovation and designs medical 3D image technology. Three information platforms are directly linked to physician communication, offering a substantial increase in traditional communication between the dyads relationship of medical practitioners. E-commerce can enable fast and accurate completion of the skull and palate-craniofacial implant customization. 3D auxiliary system responses the feasibility and modification of product standard to create and accumulate new surgery technology. IOS phone platform reduces the operation time and customization of the medical error rate, while also reducing the delay in the treatment of patients with time-course risk.

**Keywords:** Integrated marketing communication; marketing innovation; e-commerce; 3D aid system; IOS phone platform.

### 1. INTRODUCTION

“Integrated Marketing Communication (IMC) is perfectly poised at the transition from an industrial to an information-driven society.” (Kitchen, *et. al.*, 2004) IMC is also the operating way in complex multi-platform digital environment (Mortimer and Laurie, 2017). To fill customer satisfaction, IMC becomes one of the key success factors of medical management. It is necessary to persuade potential customers that medical service can meet their needs, while reducing the service gap, and improving service quality as PZB (Parasuraman, Ziethaml, and Berry, 1988). Information technology gives customers important medical information and use, such as through RFID communication, so that they can understand the content of hospital services and find outstanding physicians, or hospitals using LCD TV laparoscopic surgery via advertising. Through the media, we can see that the media tools used in science and technology are rich. Then the firms can earn a reputation for stable service (Niedricha, Kiryanovab, and Black, 2005).

IMC has different function to implement. One type of IMC's function is marketing innovation which can solve the customer need for technology. In Europe, the promotion of companies occurs through advertisements and conferences, which increase marketing value. Market research also identifies the type of clients and competitors such as customer-centric IMC (Bruhn and Schnebelen, 2017). Firms then change their distribution channels or the aesthetics of goods or service such as firm-centric IMC (Porcu, Barrio-García, and Kitchen, 2017). In the US, the firms search for new customers and new business opportunities. Promoting business can be helped by many strategies. The rate of customer adoption should be increased from some means such as practice-centric IMC (Ots and Nyilasy. 2017). In the medical arena, the quality relationship usually focuses on information communication between doctors and patients. Both clinicians and patients engage in open and informed exchanges about the appropriateness of medical apps in the particular case of insulin calculation, and future work will likely generate further insights (Huckvale *et. al.*, 2015). The information communication relationships include patients, doctors, designers, and manufacturers. The comprehensive view is very important to medical ethics and information safety.

To resolve the situation of medical equipment specifications and size which does not match the situation of domestic patients, the establishment of a human-orthopedic medical device real-time interactive design platform serving as a communication channel between manufacturers and doctors is necessary to achieve collaborative design and production. Then the orthopedic medical equipment could be customized in line with the needs of each patient. Through the integration of the platform mechanism, the use of medical 3D image transmission, and manufacturers and doctors' real-time two-way communication, adjustment and manufacture of customized orthopedic medical products can be realized. Each product should come with an audit report and QR code, so that patients can check their products' detailed information on the platform, so that patients will feel more assured, and also improve their loyalty to their doctors. Therefore, this study uses the three information system, E-commerce, 3D auxiliary system and IOS phone platform , to build the IMC.

Inter-organizational information system in medical service, IMC needs to develop the real-time view and principle. The goal of this study's marketing innovation was a platform mechanism to provide two-way communication for manufacturers and doctors, to create customized products. Through the platform mechanism, manufacturers and doctors could narrow the cognitive gap between them, and immediately modify and tailor products, so that manufacturers can also enjoy a professional medical point of view to tailor make medical equipment for patients. Secondly, manufacturers and doctors, through real-time communication, could shorten the production process, and improve the efficiency of time spent. Because the manufacturers and doctors need to communicate with each other back and forth, shortening the time to complete orthopedic equipment, by about 3 to 7 days would ensure the operation of patients with prime time advantage and efficiency. Finally, with the information communicated between manufacturers and doctors and subsequent customization of the process, the quality of medical treatment will also be enhanced. Compared with the traditional standard medical equipment, customized orthopedic products could be tailored to match each patient's bones. This would create higher value service and also improve the relative medical quality.

## 2. LITERATURE

The major theory underlying the IMC, marketing innovation and information system in design science is as follows.

## 2.1 Integrated Marketing Communication

IMC has developed over 20 years at least and informs new direction marketing (Duncan and Everett, 1993; Schultz, 1996; Kitchen, 1999). Especially, the four journals, Journal of Business Research in 1996, Journal of Advertising in 2005, European Journal of Marketing in 2017, and International Journal of Advertising in 2017, tell about the IMC theory. The supplier-buyer relationship focuses on customer-centric with the resource dependence theory (Bruhn and Schnebelen, 2017). The designer-supplier relationship concerns about firm-centric with transaction cost theory (Porcu, Barrio-García, and Kitchen, 2017). The designer-buyer relationship checks in practice-centric with communication theory (Ots and Nyilasy, 2017). This study uses relation theory to extend the real-time view. As figure 1, the three dyad relationships inform IMC's centric mind. Among three dyad relationships, the real-time view means any role should be ground its centric role in real time for the experience condition. At the same time, inter-organizational information system is able to make the well IMC for communication mechanism. Buyers have the real-time feeling service from suppliers, customer-centric achieves IMC's function. Suppliers make the real-time standard with designers, such as ERP lists Bon's all detail items, firm-centric moves IMC's function. Designers have the real-time key point (or design event) with buyers, such as a doctor leads the need of medical material, the communication-centric does the IMC's function.

Thus, this study uses the information system case to craft the three dyad relationships in the principle of marketing innovation.

## 2.2 Marketing Innovation

OECD (OECD-EUROSTAT, 2005) is divided into four categories: product (service) innovation, process innovation, marketing innovation and organizational innovation. Marketing innovation includes the implementation of a new marketing method involving signification changes in product design or packaging, product placement, product promotion, or pricing. It is aimed at better addressing customer needs, opening

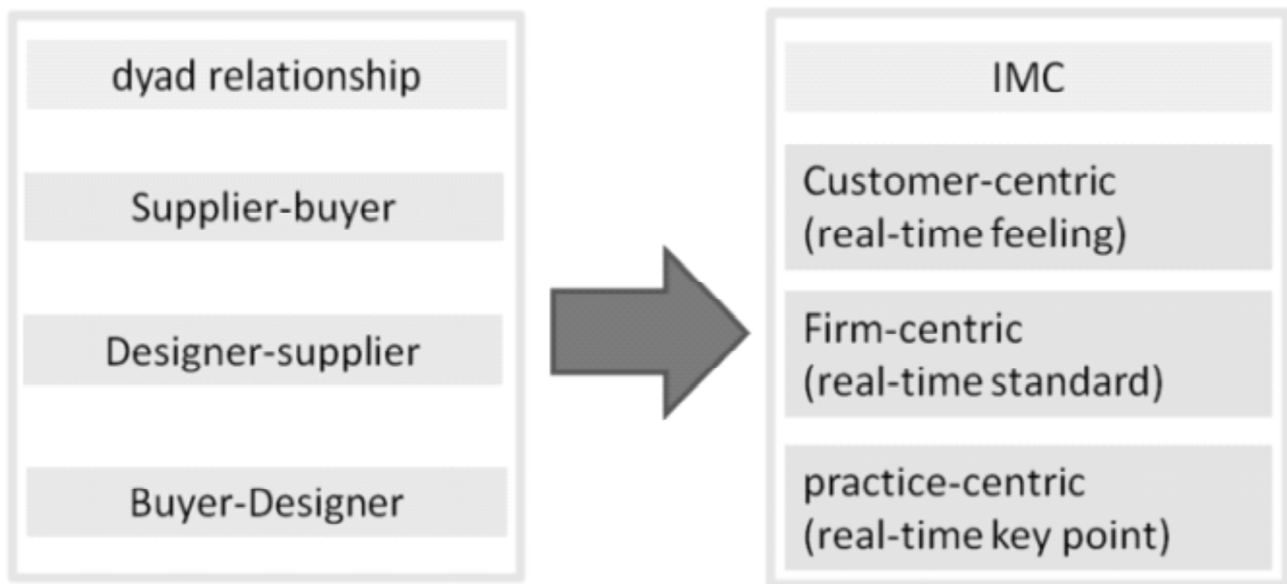


Figure 1: Dyads relationship informs IMC

up new markets, or newly positioning a firm's product on the market, with the objective of increasing the firm's sales. It must include a new marketing concept or strategy that represents a significant departure from the firm's existing marketing methods. In Europe, a firm enters a new market or new segment, or uses a new way to enter the market via distributors, or directly. Marketing innovation is related to commercialization channels, such as Business to Business or Business to Customer (Galindo-Rueda and Cruysen, 2016). In the US, they concentrate on how to package and advertise the product, or a firm reworks the packaging to present products in a new way. In particular, we also foster brand recognition. Therefore, we reference two rules (OECD-EUROSTAT, 2005 and Gupta *et. al.*, 2016) to introduce the elements of marketing innovation, such as product design or packaging (OECD-EUROSTAT, 2005), product placement or channel of communication (OECD-EUROSTAT, 2005, Trunfio, Petruzzellis and Nigro, 2006, Di Gregorio, Musteen and Thomas, 2009), product promotion or pricing (OECD-EUROSTAT, 2005), approach to market (Luo and Tung, 2007), channel of communication (Trunfio, Petruzzellis and Nigro, 2006, Di Gregorio, Musteen and Thomas, 2009, Guerrieri and Meliciani, 2005), product delivery (Guerrieri and Meliciani, 2005, Singh, Garg and Deshmukh, 2008 ) and service delivery (Gandolfo and Padelletti, 1999, Kask, 2013).

### 2.3 Information System

An information system has three elements input, process, and output (Powell, Piccoli and Lves, 2004). The outside environment inputs data on surgery-related conditions. The data are implemented in an information system, APPS. The output produced has useful information, the prototype design of skull implants.

Regulators impose a burden, the need to balance risk with the impact on innovation from the sheer volume of apps available (Charani, Castro-Sanchez and Holmes, 2014). Manufacturers who do not understand the needs of patients can only employ a general standard. By a collaborative design of customized products, manufacturers use the platform to communicate with doctors; the doctors' professional opinions reveal the needs of patients, so that customized medicine can be provided. The medical equipment industry has a high threshold to enter, and market development is not easy, and not only because the surgeon is the only customer for the product. In addition, doctors' new product acceptance is often very low, requiring long-term communication to convince doctors to change medical equipment and products. This study designed a two-way communication mechanism. The platform not only allows doctors to deal directly with manufacturers of products, but also to make detailed adjustments for product design specifications; with such a two-way communication, the doctors will feel more at ease with the medical system, thereby increasing physicians' favorability regarding the product.

Consumers (patients) are less comfortable with new products and are less likely to choose new products. There is no evidence of developers of apps acting other than in good faith (Huckvale *et. al.*, 2015). Therefore, the sensitivity of consumers can also easily be improved a lot. This study designed an open and transparent platform. In the product check-up book, for each customization of medical materials, consumers have their own QR code; with the scan, the platform can 'see' their customized medical materials and data, so that platform transparency gives consumers the right to know, and greater ease to use.

## 3. METHODS

We used design technology to construct the IMC and analyzed the references; the risks were also considered in the information system.

### 3.1 Design Technology

#### 3.1.1 System design

The system integrated a database and applications for multilingual capabilities, multiplayer support, and security and vulnerability fixes.

#### 3.1.2 Application server

The server was able to provide configuration settings for easy subordinate applications, customized security features to reduce network attacks, user-oriented management interface, easy management, and elasticized expansion modules.

#### 3.1.3 Database

The database can handle tens of millions of information bytes, and optimize SQL query syntax to improve query speed. A multi-language compiler provides APU for system integration, supports multi-threaded full use of CPU as well as multiple execution capabilities.

#### 3.1.4 Development tools

There are built-in diverse development components for object-oriented development, a dynamic cache support mechanism to improve web page execution speed, built-in diversified function library to improve development ability, and MVC architecture, making multiple simultaneous development easy.

### 3.2 Analytics

IMC's role plays in information technology as figure 2. There are three real uses for three dyads relationships. The information technology has three system structures including electronic commerce, 3D auxiliary system, and IOS phone platform. That should be showed and drafted by the type of marketing innovation. Marketing

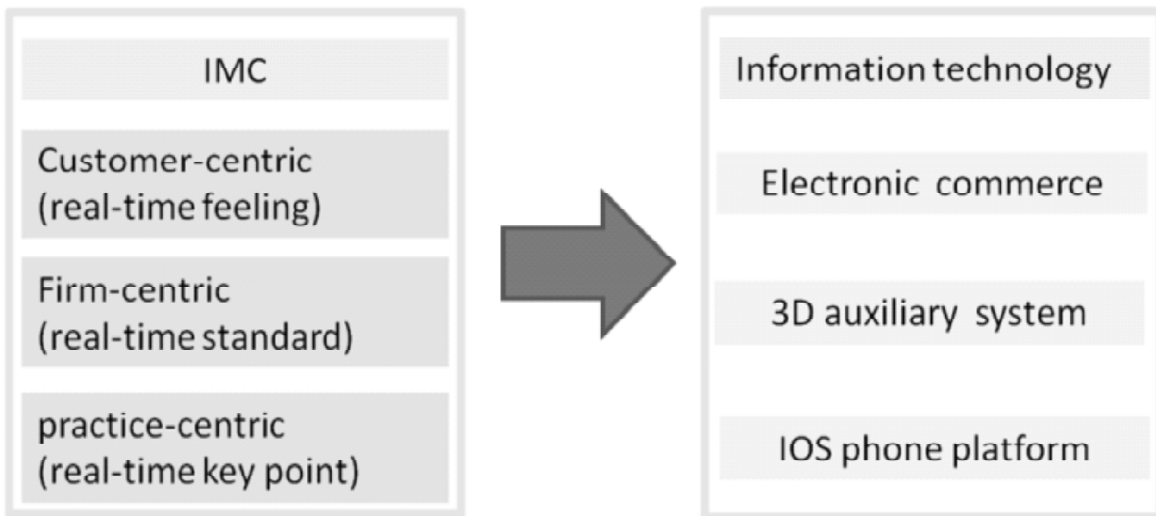


Figure 2: IMC adopts information technology

innovation functions include product design or packaging, product placement or channel of communication, product promotion or pricing, approach to market, product delivery, and service delivery. We referenced scholars and give examples in Table 1. All the functions of marketing innovation have themselves' shadow in the three dyad relationships, such as real-time feeling, standard and key point.

**Table 1**  
**Marketing innovation in Medical implants**

| <i>Function</i>                               | <i>Examples</i>                            |
|---|--|
| Product design or packaging                   | Skull implant in surgery                   |
| Product placement or channel of communication | Traditional retailers or wholesalers, APPS |
| Product promotion or pricing                  | Social media in community                  |
| Approach to market                            | Customized purchasing                      |
| Product delivery                              | Clearly stated implants                    |
| Service delivery                              | Open visual processes                      |

### **3.3 Risk Analysis**

For designing medical IMC, we controlled the risk (Charani, astro-Sanchez, Moore and Holmes, 2014; Barki, Rivard and Talbot, 1993) and referenced (Ross, Mcevilley and Oren. 2016). There are three risks, as follows:

#### **3.1.5 Technical risk**

Technology should control three risks. The complete test mechanism would first be established. The software code was scrutinized; the software version should be more controlled and modified.

#### **3.1.6 Cloud risk**

Cloud is a most useful technology tool. The user needs an auditing log function design. All users should have the roles of personnel responsibilities defined. In accordance with ISO 27001 requirements; it was designed to meet the cloud application management mechanism. We also regularly implemented scans and penetrated testing system vulnerability.

#### **3.1.7 User risk**

The user account should have management mechanism, and the password set must be more than 8 English numerals. Personal data processing in the system is according to the personnel data law design. Thus data access and Log data would be managed.

## **4. RESULTS**

In addition to the continuous training of R&D personnel, and the integration of existing mold, machining and other core technologies, investment in medical products, all kinds of raw materials development, increased product line, and cooperation with the existing medical institutions to develop models to improve

patient well-being with increased medical quality are required. At present, Taiwan's doctors are importing foreign orthopedic equipment; because size and specifications do not meet people's bones, they need to be modified for surgery. In order to solve the problem of information asymmetry and IMC between orthopedic equipment manufacturers and physicians, we want to create a unique design platform that provides instant IMC between manufacturers and physicians to achieve collaborative design and development, shorten processing time and increase golden aged patients' medical treatment. The study referenced Table 1 to illustrate marketing innovation.

#### **4.1 Product Design and Packaging**

The product packaging in Europe has made firms' names and products more visual in redesigned new delivery bags, in order to "stick out" at the post office [3]. Added value and innovation in packaging were considered. Products are presented through platforms to help doctors and manufacturers enable in frequent exchanges, to create customized implant products. The product can be delivered in three to seven business days, the product's audit report is included with each product, and the patient can also scan the QR code provided on the box. After connecting to the platform, their purchase of the product and the product audit information were viewed. The coordination of the platform aimed to create not only customized products, but also more valuable services.

To carry out the product design and packaging, there are three examples of system development in this study.

- *Download medical images in new design:* Designers can click on the "download Dicom file" to obtain medical images. (real-time feeling)
- *Designation of the designer:* After the new case is established by business, the case needs to be assigned to the designer. (real-time standard)
- *Advanced modified condition:* The designer clicks "Completed" to modify the status of the case. (real-time key point)

Thus, the three dyad relationships are come into being in real-time IMC.

#### **4.2 Product Placement and Channel of Communication**

This pathway is the real-time interactive design platform built after the implementation of the plan. The medical side can engage in intensive contact with the factory through the platform. Because the platform is the customized design image of the medical side, the medical side can accurately master the information and process the progress of the products to ensure that the customized medical materials are delivered to the hospital and can be used when the patients are treated.

In regard to building the product placement and channel of communication, there are two examples of system development in this study.

- *Member management:* Member management uses input data. The communication channel controls important customers or doctors. (real-time feeling)
- *Doctors legally share with the patient:* Doctors can legitimately share cases with other doctors, patients or family member. After setting the expiration date and password, the doctor clicks "Generate

link” to generate a QR code image. Then, the case can be posted to share with the person. The person receiving the case inputs the password and views the content. (real-time key point)

Therefore, the two dyad relationships are found in real-time IMC.

### 4.3 Product Promotion and Pricing

Galindo-Rueda and Cruysen (2006) seeking to provide a clearer and more unified message in targeting both existing and potential clients had redesigned firms’ websites and brochures. The firms stopped using print for ads and catalogues; instead, they sent pdf versions by email to their target audience. This study used webs such as Home rotation slide and Home rotation new product list. In the building platform, you can find well-known hospitals or doctors of higher prestige to try this interactive platform. We provided an account password that they can always use, and then asked about the impressions of this platform. Moreover, from time to time product briefings were held in the major hospitals on the use of the platform. We also directly received their own product information, or for the customization of medical issues and related topics to engage in thematic sharing. Mining penetration strategy, with 25-30% of the price discounts, was used to compete with existing products. The use of market prices prior to the program to compete with existing market products is not competitive. After the completion of the project, in accordance with the different circumstances, the price discount was adopted in three ways: a physician price discount of 35%, hospital price discount of 30%, or the dealer’s price discount of 25%.

Regarding product promotion and pricing, there are three examples of system development in this study.

- *Home rotation slide:* The slide changed with new promoting strategy. The 9 new promoting messages rotated by slides. (real-time feeling).
- *Home rotation new product list:* The new product list was shown with new promoting or pricing strategy. The 8 maps and illustrations would be viewed. (real-time standard).
- *Renew pricing:* A table was used to audit the pricing condition. The medical firms could see the new pricing or maintained pricing. (real-time key point).

Hence, the three dyad relationships are created in real-time IMC.

### 4.4 Approach to Market

The aim is to create a profit-sharing mechanism to encourage doctors to put forward ideas and concepts of products, thereby enhancing the doctor’s loyalty to the manufacturers, but also because of customization and small number of manufactured products, the average cost is higher. In order to overcome the geographical and spatial impact, resulting in the delayed treatment of golden age patients and the gap between doctors and manufacturers in communication; the establishment of a real-time interactive design platform, can significantly enhance the communication between the medical side and the factories, The medical side can also use this platform for the design of customized medical equipment, to provide more valuable services.

To achieve a successful approach to the market, there are two examples of system development in this study:



- *Role play strategy:* The user should set the role it will play in the case. Using role play strategy can realize and reveal the important role in the case. (real-time feeling).
- *Smartphone in web and IOS APP:* In the IOS version of the main service case, the designer and doctor will be managed by the web version of the case, so that the mobile version (hereinafter referred to as the m version) features are based on the client's specifications (and the main case). (real-time key point).

Consequently, the two dyad relationships are set up in real-time IMC.

#### 4.5 Product Delivery

With the aging of society and the frequent occurrence of accidents, artificial bone and craniofacial reconstruction needs are not underestimated, but most of the medical equipment on the market is standardized manufacturing; the doctor must modify the medical equipment for patients or even excise the excess bone of patients. In order to create more orthopedic equipment to fit the craniofacial features, consumers no longer need cutting; we will customize the product to enhance and fill in the gaps regarding the quality of medical equipment.

Regarding product delivery, there are five examples of system development in this study.

- *Product management:* To show all products, managers can click the top right "Add product" to add products. Customers can use the left marquee to modify the product specifications in batches, or use the blue area above the product list to quickly search for products. The Product Edit page enables you to edit product-related information. (real-time standard)
- *Case schedule list by role:* According the role, the case assignment and details in the schedule can be viewed. (real-time feeling)
- *View 3D map:* The doctor views the case design (new case). Because it is a new case, there is no designer and design draft. Secondly the doctor also views Case Design (Design) and sees the designer's 3D graph. The three steps are: design, agree with design, and completed. (real-time key point)
- *Add comments (doctors):* The doctor of the case can add comments to record the detailed information in relation to design and surgery. (real-time feeling)
- *Cancel comments (Doctor):* You can then click "Cancel Changes" to cancel or re-enter your message and click "Save Changes" to complete the addition. (real-time feeling)

Accordingly, the three dyad relationships are established in real-time IMC.

#### 4.6 Service Delivery

In the current medical industry, the time difference is a big gap in demand. Patients have to wait for imported medical equipment, and doctors even have to adjust the material on the surgery. In order to solve and compensate for the urgency of time and the prime time of operation, we provide a platform to shorten the time and satisfy patients' needs.

To finish the service delivery, there are four examples of system development in this study.

- *Inquiry form*: Using the inquiry form can realize and confirm the order. (real-time feeling).
- *Case handling process*: We created a new case handling process as follows: (real-time key point).
  - *New Case*: The status of the order has not been assigned to the designer.
  - *Design*: the business was assigned to the designer, but the owner has not yet agreed to the design of the state.
  - *Agreed design*: The owner agreed to the design, but it has not yet entered production; it will then enter production.
  - *Completed*: Production was completed before the owner closed. Closed: The owner determines the status of the closed case.
- *Add comments to modify data*: It increases the modification opinions by doctor, to be discussed in production. (real-time standard).
- *Add discussion*: Below the changes you've added, you can revisit this change. After entering the content, click "Add Discussion" to add. (real-time feeling).

As a result, the three dyad relationships are built up in real-time IMC.

## 5. CONCLUSION

IMC is different from the development of enterprise products and services, business processes and organizational innovation. To develop the craniofacial implants in the information system process, this study uses marketing innovation to establish important guidelines and shows the IMC information system design. In order to expand the development of IMC theory, this study provides an information system model. The three dyad relationships are all illustrated by real-time feeling, real-time standard and real-time key point. The approach to a market development optimization platform mechanism can provide service delivery and enable manufacturers and doctors to achieve two-way communication customized products. Manufacturers and doctors using product placement and channel for real-time communication will shorten the product process, improve time efficiency and product delivery. Product design promotes better communication and coordination between manufacturers and doctors, quickly completes product promotion or pricing, and improves the quality of medical care.

Another important contribution of this research is the emphasis on IMC. In the past, customer or firm centric is one view, the real dyad relationship should be more discuss and contributed in the information system. When the IMC gap exists, the development of a customized information system is very important. The more assessments of the quality of smartphone health-related apps, the more sets of criteria proposed to enable future studies to consistently review health-related app quality in a standardized manner (Bin Dhim, Hawkey and Trevena, 2015). In particular, International Standard ISO/IEC/IEEE 15288 (Ross, Mcevilley and Oren, 2016) should be more considered in relation to risk analytics in cloud.

In the current orthopedic equipment market, manufacturers and doctors, through the platform integration, can achieve collaborative design and manufacturing, and solve the fitting problem of medical

equipment to achieve customized products more in line with disease-related needs. Compared to imported medical equipment, the two-way communication of customized medical equipment achieves the advantage of the shortest modification time. In addition, medical quality will enhance well-being, and the value of services will also be higher than with the generic designed medical equipment. Henceforward, the IMC strikes up the dyad relationship with information system.

Finally, IMC is very important for visual marketing development. The patient's major customization needs the physician's medical procedures, and it can significantly shorten the time of suffering. Now on, inter-organizational theory is also showed in IMC. This study makes more one step to increase the fit of theory and experience.

At present, Taiwan's craniofacial and orthopedic equipment market is still dominated by imported equipment. Although several listed domestic manufacturers are continuing research and development of related equipment, Taiwan's manufacturers are still in the development stage. Few companies have sufficient resources to carry out product development. Only the Government can provide cooperation programs combined with ITRI technology, and other measures. The limited design talent for domestic craniofacial equipment is a major part of the industry resources gap. In addition, foreign markets have adequate resources and marketing innovation capability. Since they are large sized, they can easily achieve economies of scale, and meet the aggregate market demand for customized products. However, the orthopedic equipment in Taiwan is usually standard size; no domestic manufacturers offer customized orthopedic equipment. If the patient is a special case, doctors need to order from abroad, so waiting time will be a big problem.

For the future management practice research proposal, this study proposes three strategies.

First, the construction of collaborative manufacturing and design would improve medical quality and time efficiency. Like the past, and in the present, medical equipment, doctors receive standardized medical equipment from manufacturer; the proposed platform can help integrate manufacturers and doctors and remove the cognitive gap for collaborative manufacturing and design, so that products can have higher medical quality. Collaborative design platforms have been used in other fields for many years; at present, "medical image + 3D surgical simulation" of the network platform combined with "reconstruction plastic implants" market are not yet in use. This research is different from the existing applications. In particular, the customized product can shorten operation time by 30 to 60 minutes, which is conducive to reduce the surgical implant modification and repair time. The implementation of craniofacial plastic surgery can also reduce the risk of excessive blood loss during surgery.

Second, creating the service integration mechanisms will increase consumer loyalty. In this study, medical 3D images were used as a communication media to enable physicians to respond to product feasibility and modification. The product may be part of the size of the 3D image and need to be amended; the doctor will respond to the system in regard to the product requiring modification. For example, the system will submit online doctor orders, annotation module and 3D VIEWER module, so that doctors can complete online comments on the 3D part; doctors do not need to learn 3D CAD, as professional 3D modification by the GMP factory is responsible for uploading. Through the platform, we not only sell the product itself, but the integration of services. Through the platform mechanism, we can create customized products, improve the efficiency of time spent; since the platform is transparent, every patient can easily check their purchase of products.

Finally, a profit-sharing mechanism is created for obtaining the derivative benefits of the program. In addition to co-designing and manufacturing with doctors' assistance, the simple 3D images need to be trained in education, such as through a simple instruction manual. In addition, there are sub-run mechanisms to encourage doctors to put forward professional ideas and concepts to work together with manufacturers in synergy. It benefits more patients, increases the loyalty of doctors and enhances firms' market share.

## ACKNOWLEDGMENTS

The authors thank the editor and the two referees for their constructive comments. This research was supported by grants from the Ministry of Science and Technology (MOST grants 104-2622-H-324-001-CC3, 105-2622-8-003-002-TS1, 106-2622-8-003-001-TS1 and technology of MOST 104HFD281185, 106HFD281197, 106HFD281198).

## REFERENCES

- Barki, H., S. Rivard, and J. Talbot. (1993), Toward an assessment of software development risk. *Journal of Management Information Systems*, 10(2): 203-225.
- BinDhim N. F., A. Hawkey, and L. Trevena. (2015), A systematic review of quality assessment methods for smartphone health apps. *Telemed J E Health*, 21(2): 97-104.
- Bruhn, M., and S. Schnebelen. (2017), Integrated marketing communication – from an instrumental to a customer-centric perspective. *European Journal of Marketing*, 51(3): 464-489.
- Charani E, E. Castro-Sanchez, L. Moore, and A. Holmes. (2014), Do smartphone applications in healthcare require a governance and legal framework? It depends on the application! *BMC Med*, 12: 29.
- Di Gregorio, D., M. Musteen, and D. E. Thomas. (2009), Offshore outsourcing as a source of international competitiveness for SMEs. *Journal of International Business Studies*, 40(6): 969-988.
- Duncan, T., and S. Everett. (1993), Client perceptions of integrated marketing communications. *Journal of Advertising Research*, 33(3): 30-39.
- Galindo-Rueda and Cruysen. (2016), Testing innovation survey concepts, definitions and questions: Findings from cognitive interviews with business managers. OECD Science, Technology and Innovation Technical Paper.
- Gandolfo, A., and F. Padelletti, F. (1999), From direct to hybrid marketing: A new IBM go-to-market model. *European Journal of Innovation Management*, 2(3): 109-117.
- Guerrieri, P., and V. Meliciani. (2005), Technology and international competitiveness: The interdependence between manufacturing and producer services. *Structural Change and Economic Dynamics*, 16(4): 489-502.
- Gupta, S., N. K. Malhotra, M. Czinkota, and P. Foroudi. (2016), Marketing innovation: A consequence of competitiveness. *Journal of Business Research*, 69: 5671-568.
- Huckvale, K., S. adomaviciute, J. T. Prieto, M. K. S. Leow, and J. Car. (2015), Smartphone apps for calculating insulin dose: a systematic assessment. *BMC Medicine*, 13: 106.
- Kask, T. (2011), Strategic decisions as drivers of innovation: The case of micro link. *Baltic Journal of Management*, 6(3): 300-319.
- Kitchen, P. (1999), *Marketing Communications: Principles and Practice*. Cengage Learning, London.
- Kitchen, P., D. Schultz, I. Kim, D. Han, and T. Li. (2004), Will agencies ever get (or understand) IMC?“, *European Journal of Marketing*, 38(11/12): 1417-1436.
- Luo, Y., and R. L. Tung. (2007), International expansion of emerging market enterprises: A springboard perspective. *Journal of International Business Studies*, 38(4): 481-498.
- Mortimer, K., and S. Laurie. (2017), The internal and external challenges facing clients in implementing IMC. *European Journal of Marketing*, 51(3): 511-527.

- Niedricha, R.W., E. Kiryanovab, E. and W. C. Black. (2005), The Dimensional Stability of the Standards used in the Disconfirmation Paradi. *Journal of Retailing*, 81(1): 49–57.
- OECD-EUROSTAT (2005), *Proposed Guidelines for Collecting and Interpreting Innovation Data* - Oslo Manual 3rd edition. OECD, Paris.
- Ots, M., and G. Nyilasy. (2017), Just doing it: theorising integrated marketing communications (IMC) practices. *European Journal of Marketing*, 51(3): 490-510.
- Parasuraman, A, V. Ziethaml, V. and L. L. Berry. (1988), SERVQUAL: A Multiple- Item Scale for Measuring Consumer Perceptions of Service Quality. *Journal of Retailing*, 62(1): 12-40.
- Porcu, L., S. D. Barrio-García, and P. J. Kitchen. (2017), Measuring integrated marketing communication by taking a broad organisational approach: The firm-wide IMC scale. *European Journal of Marketing*, 51(3): 692-718.
- Powell, A., G. Piccoli, and B. Ives. (2004), Virtual teams: a review of current literature and directions for future research. *The DATABASE for Advances in Information Systems*, 35(1): 6-36.
- Ross, R., M. Mcevilley, and J. C. Oren. (2016), *Systems Security Engineering: Considerations for a Multidisciplinary Approach in the Engineering of Trustworthy Secure Systems*. U.S. Department of Commerce, National Institute of Standards and Technology, NIST Special Publication (SP) 800-160.
- Schultz, D. (1996), The inevitability of integrated communications. *Journal of Business Research*, 37: 139-146.
- Singh, R. K., S. K. Garg, and S. G. Deshmukh. (2008), Strategy development by SMEs for competitiveness: A review. *Benchmarking: An International Journal*, 15(5): 525–547.
- Trunfio, M., L. Petruzzellis, and C. Nigro. (2006), Tour operators and alternative tourism in Italy: Exploiting niche markets to increase international competitiveness. *International Journal of Contemporary Hospitality Management*, 18(5): 426–438.