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The Study of Implications on Modern Businesses Performances by Digital Communities: Case of Data Leak

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***Abstract*—**This study aims to investigate the impact of data leak of M&S customers on digital communities. Modern businesses are using digital communities as an important public relations tool for marketing purposes. This form of communication helps companies to build better relationship with their customers which also act as another source of information. The communication between the customers and the organizations is not regulated so users may post positive and negative comments. There are new platforms being developed on a daily basis and it is very crucial for the businesses to not only get themselves familiar with those but also know how to reach their existing and perspective consumers. The driving force of marketing and communication in modern businesses is the digital communities and these are continuously increasing and developing. This phenomenon is changing the way marketing is conducted. The current research has discussed the implications on M&S business performance since the data was exploited on digital communities; users contacted M&S and raised the security concerns. M&S closed down its website for few hours to try to resolve the issue. The next day M&S made a public apology about this incidence. This information was proliferated on various digital communities and it has impacted negatively on M&S brand name, sales and customers.

The content analysis approach is being used to collect qualitative data from 100 digital bloggers including social media communities such as Facebook and Twitter. The results and finding provide useful new insights into the nature and form of security concerns of digital users. Findings have theoretical and practical implications. This research will showcase a large corporation utilizing various digital community platforms and can serve as a model for future organizations.

***Keywords*—**Digital, communities, performance, dissemination, implications, data, exploitation.

I. Introduction

IN recent years the concept of digital community has emerged when individuals interact with each other through the digital community channels. The purpose of that communication is to pursue mutual goals and interests without political and geographical boundaries [1]. The rise of internet's use has changed our lives especially the ways we work and communicate and that has led to digital communities [10]. Due to internet supporting the synchronous and asynchronous communications in various ways, digital communities' store, capture and disseminate the information more quickly and effectively [11], [23]. The continuous growth of digital communities has evolved and the expectations within various businesses to implement strategic models using this technology [5].

There are plenty of benefits of using the digital communities in terms of disseminating information relating to products and services, building better customer relations and enhancing customer services [5]. The digital communities could also be used for collaboration, learning about other businesses models and acting as dynamic forums for knowledge. In spite of having various advantages, it also needs to be recognized that the digital communities could harm the business reputation by disseminating negative information [17]. Although companies cannot control information dissemination in digital communities, they can minimize the risks to their reputation by making sure they know what is being said about their products and services, by monitoring and participating in the digital communities [16]. This research seeks to explain how digital communities can be made to work for the organization by proposing a fit between the digital community model to be adopted and the company's feedback goals. This research will also determine ways of benefiting from digital communities while minimizing the risks. Finally, this paper will use the mixed method approach and quantitative and qualitative data techniques as well as to compile the findings.

This research paper is categorized into six sections. The Section I discusses the introduction, section II describe the literature review, Section III explains methodology and Section IV represents the data analysis and findings. The last two sections discuss implications and conclusion.

II. Literature Review

According to Blanchard [4], "A digital community incorporates a considerable historical past, such as cosmology, a typical cultural and historic heritage, societal interdependence, and an imitation cycle". Boyd and Ellison [6] identified the community as a group of people who will try to gather together their experiences and differentiate it to the group. Based on the views of Christy, Cheung and Matthew [8], the digital community is characterized by individual who frequent visit a site. It can comprise of socio-technical individuals who discuss and create information, experiences, and views which has a single purpose or maybe a common exercise as a group enterprise. Hagel and Armstrong [12], [22] classify understanding digital communities as task-based,

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practice-based, and knowledge-based communities. Most of these digital communities are classified on the basis of four measurements particularly: learning goals, memberships, task features and system intended for further expansion and imitation [3].

For consumers, the most important benefit is the wealth of information that can be found within these communities [24]. Knowledge and experience regarding products, services, brands, producers, and retailers are shared by consumers [38]. The community can also be consulted for purchase and usage suggestions, even for troubleshooting when a product fails. Because the information is provided by other consumers, it increases in credibility, trustworthiness, and relevance [41]. This is because people assume that other consumers have no ulterior or commercial motives. Through fellowship and commonality amongst like-minded enthusiast, communities offer social benefits to their members [2], [27].

According to Vries [42], digital communities also act as rich information sources for producers, giving them insight in consumer needs, values, norms, attitudes, and behaviors, based on member contribution and discussions. It was Serra [36] who wrote that insight can be gained in the relationships between personal identity, social identity and brand identity. Another major advantage of communities brought forward by Rheingold [35], is that they can be monitored real-time, in an unobtrusive way. This makes reality checks and sensing of market forces more cost effective compared to traditional focus groups, surveys, and interviews [40], [25].

Most of all, many marketers believe that the facilitation of brand communities is cost effective and powerful [26]. Looking at all these benefits, it can be said that brand communities are powerful compared to other marketing tools and cost effective [30].

The communication through the internet has changed the way we live and interact with each other and it truly is changing the way in which many of us live. Record, storage space, dissemination and era involving information come quickly and effectively within digital communities since the internet permits synchronous and asynchronous conversation in numerous methods [28], [29]. These communities can impact on the strategy adopted by companies [37]. There are potential benefits to this approach as well as issues. On one side, organizations will find advantages of getting enriched customer support, better client interaction and it could also incorporate message boards pertaining to expert discussions, understanding and collaboration [30]. In contrast, digital communities may be used to share negative information about a company that may cause harm to its standing, ultimately causing loss of customers [39]. The implication is that organizations must take note of digital communities and determine how to make use of those for their benefit while minimizing the perceived threats [32].

Diverse descriptions of digital communities exist within the literature and several descriptions are incredibly inflexible, while others are more adaptable. The digital community is often a multidisciplinary concept used within sociology, information technology, expertise administration and education [33], [16].

Digital communities were initially thought to be social phenomena [34], [31]. This is evident through the definition of digital community as being a social aggregation that emerges through the web when enough people go on public discussions, to form webs of personal relationships in cyberspace [43]. Benefits of a digital community would likely arise from two features: from the unique capabilities of the digital medium where the digital community is situated in and from the exclusive community model itself [21]. The latter aspect is usually what differentiates digital residential areas from other online Websites. Unlike other online Websites, a digital community is intended to make a "sense of community" which binds individuals to the web page and serves as the particular "push" factor for do visits [4].

Although the start-up cost of a digital community is somewhat low, the costs involved in maintaining it are considerably higher. Therefore, the decision of whether to make a digital community in support of the e-commerce Web site is not to be taken lightly [6]. Critics have also questioned the validity of the suggested benefits of the digital community, particularly since there are no clear-cut measures to verify the benefits which are attributed to the digital community [14]. Furthermore, the fundamental premise that the digital community relies on to its success, that is, its unique convenience of interaction amongst members and/or using the company is subject to high risks. This is because clients can always turn this power to the company's disadvantage simply by spreading adverse comments about the company's products [9]. Hence, a digital community actually provides the means to work both for as well as against the company using it [8], [19].

III. Methodology

The case study approach is adopted in this research to investigate the effect on businesses performances of digital communities [13]. The research is specifically exploring the concerns raised about M&S leaking confidential customer data on digital communities. The use of digital communities is quite diversified and could be used for positive and negative effects. The users of digital communities identified the data mishandling by M&S and immediately exploited the information on various digital communities. The theme of the research is to explore the strategies M&S could have adopted to minimize the risks of negative feedback and what methods could have been enforced to ensure the data security without harming the business performance.

The best way of conducting the social science research is through a case study method [13]. This method ranges from a single person to a group interaction and not limited to institution, policy or an event. The case study method is best to be used for this research due to its ability to conduct in-depth examination of events which are not under the investigator's control [14]. This method is also very useful when conducting research on a real-life based context which leads to the questions e.g. what was the result, what was the decision, how those decisions were implemented?

Conducting research through a case study method is classified as an empirical method or as exploratory which uses different evidence collected from various sources [18]. The weaknesses and strengths are not just limited to the direct participant's observations but also include archival records, documentation, physical artefacts and interviews. Using a methodology based upon case study approach is very helpful for not only finding a solution for an existing issue but also for conducting a new research. The case study approach helps to fill gaps in the existing literature.

The platforms created by digital communities have been used by various organizations to ascertain feedback about their products and services [18]. Along with the evolution of various digital communities, it has generated a concept of data monitoring over the web. Various satisfied or dissatisfied customers leave feedback and it was very difficult for the businesses to establish those facts considered helpful for the business growth. The research methodology based on a case study approach would be very helpful to find out how organizations can minimize the risks of negative feedback placed on various digital communities [18].

In a case study based research approach, it is very important to consider the strategies adopted by the businesses to minimize the negative feedback left by the customers so to avoid negative impacts or effects on their business performances [13]. This starts with managing more dedicated links to various digital communities and using social data monitoring tools to find out the feedback by searching through specific words. In the current scenario where various digital communities are used to post feedback about organizations, it is also important to protect the informed consent and privacy of the customers.

The feedback about M&S was collected digital from various digital communities, blogging web sites and forums. Altogether feedback from 110 users was collected and content analysis approach was used to analyses the qualitative data. The term content analyses was first coined in early 1940's and cited within the mass communication literature. Content analysis was originally used for quantitative data whereas now it is used for the qualitative approach. Content analysis approach is best used where behaviors and patterns are quite evident from the data [14]. It is also used in situations of latent content where data interpretation requires appropriate evidence in meanings and relations.

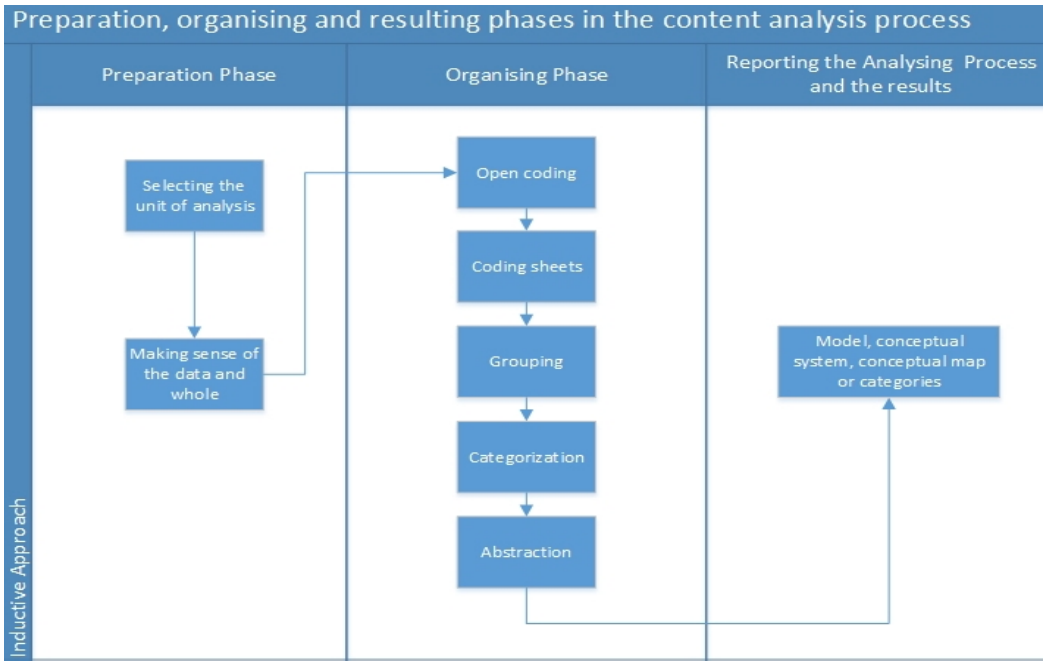

Fig. 1 Inductive Content Analysis (Adapted from [15])

In the current scenario, the research is not only to observe the causes of the negative feedback but also its impact on business performances, so latent content analysis approach will be used. For example, users of various communities have shown similar concerns and worriedness relating to the data leak in M&S and its availability on social media and digital communities but no one has commented on why they think that privacy is important for them. At the same time, M&S closed down its website for a few hours to fix the issues and then put an apology message on the digital communities for this chaos. Various users commented that they would not use M&S in the future because M&S do not have the correct polices to protect customers' data. This negative feedback has been further commented by various other users of digital

communities and has brought further anxiety amongst them. This may have resulted negatively on M&S business performance. Some digital communities have been left un-attended by M&S and users may have gained negative impressions about the business. Content analysis is a flexible approach which could be used not only deductively but also inductively. The theme behind deductive approach is to move from general to specific whereas in inductive approach it moves from specific to general.

The deductive approach is used in research when knowledge is available about the existing body and inductive approach is used by contrast when enough knowledge is unavailable to identify a particular behavior or phenomenon. The inductive approach is being used in this research because of the underlying concerns of various users raised due to changes in M&S' systems that caused the data leak on digital communities. The other reason to use the inductive approach in this scenario is to assess the impact on M&S business performance as a result of the negative feedback posted on digital communities.

A model presented by Elo and Kynga [15] indicates that content analysis involves three steps which lead to data collection through systematic approach, themes generation, abstraction and categorization.

The preparation phase of content analysis starts with the single theme of a word or selection of units. In our study the unit of analysis is the word leading to themes emerging from sentences starting from the specific instances to generalization and category formation, resulting in abstraction and conceptual formation of the research topic.

IV. Data Analysis and Finding

The preparation phase starts with identifying the unit of analysis and is derived from – key-words-in-context KWIC [7]. The word count frequencies and tag cloud are used to identify the main areas to focus in addition to going over the data manually and generating notes for the main topics emerging.

The word tree maps are also used to probe main areas of interests emerging to see how they are related to other areas of interest for example Digitalization key word shows links to, for example, innovation, privacy invasion and Cloud. Similarly, content analysis is carried out for other key words at initial stage. The instance count for key words was Digital: 180, Security: 363, Data Leak: 267, Customer Data: 562, Cloud: 158 resulting in sufficiently large base for open coding. Open coding was used as the first stage and enabled categorization and grouping of related themes leading to abstraction of ideas and conceptual formation of the topic under investigation.

The main point of discussion in the data was the concerns for privacy resulting from the customers' personal data leak by M&S. The underlying causes for this privacy concern were not evident directly from the data as if a question is asked to a person whether privacy is important to them then their answer will overwhelmingly be "yes", although if it is asked what do they mean by privacy then their answers will vary based on the context through which they will define privacy. The latent thematic analysis tried to probe the underlying meaning and causes for certain phenomenon or behavior.

Our results suggest that users of this new digitalized system showed anxiety as a result of these services when it was used as a personal details scanning tool. The potential of misuse of this technology caused anxiety in the users and it was compounded by the fact that their personal detailed data could be compromised. The perceived invasion of privacy was linked with the sense of insecurity and injustice when using such system, for example customers feel being tracked and they perceive that if they make a mistake or someone else makes a mistake whilst using this system, they will not have the chance to justify the events or actions and they will or maybe flagged as fraudsters.

Efficacy is defined by Fielding [18] as, "… it involves generative capability in which component cognitive, social and behavioral skills must be organized into integrated courses of action to serve innumerable purposes." The self-efficacy could be defined as, "one's belief in one's ability to succeed in specific situations" [20]. The users or intended users of the system showed anxiety with self-efficacy with new digital digitalized business model technology adding to sense of injustice and emotional anxiety. The sample codes are provided in Table I. To show the process of theme 'Anxiety over Perceived Invasion of Privacy and Security' generation.

Marks & Spencer customers were left fuming last night after logging into their online accounts to find other users' personal details. The London-based retailer, which has more than 1,300 stores worldwide, temporarily suspended its website while the 'technical issue' is investigated - but strongly denied it had been hacked. Customers claimed they could see order histories, personal addresses and other details of different account holders online when they logged on to register new 'Sparks' reward cards.

V. Discussion and Implications

Marks & Spencer has apologized for the data breach that forced it to suspend its website for two hours after customers were able to view other people's personal details when logging into their accounts online. The retailer blamed a technical issue, which affected thousands of customers, and said it acted quickly to resolve the problem. It stressed that it was not hacked by a third party and that no one's financial details were compromised. The company said that it was writing to every customer affected to "apologies and to assure them that their financial details are safe". Its statement came after several shoppers called on M&S to provide reassurance that their details would not be misused.

M&S customers posted messages on the high street chain's Facebook page to alert it to the data breach. They said they were able to see past orders and personal information of other customers online when they logged on to register their new Sparks reward cards. British retailer Marks & Spencer temporarily suspended its website on Tuesday night, after some customers complained they could see each other's details when they logged into their own accounts.

Posting on the company's Facebook page, customers expressed alarm that they could see other people's orders and payment details when registering for the new members club and card scheme called "Sparks. The company was keen to stress that this was not a breach by outside third parties, but was as a result of internal 'technical difficulties'. M&S said. "This allowed us to thoroughly investigate and resolve the issue and quickly restore service for our customers. We apologies to customers for any inconvenience caused."

TABLE I
THEME FROM CONTENT ANALYSIS SHOWING UNDERLYING CAUSES SECURITY CONCERNS

Theme	**Anxiety Over Data Leak**			
Category	**Anxiety over potential Technological misuse.**	**Insecurity**		**Self-efficacy and technology comfort**
Sub-category	**Data Leak**	**Sense of Insecurity**	**Impact on Business**	**Anxiety over personal financial data**
Codes	"Bad timing for **M&S data leak** - on day it's in the news for Q4 update. Insists no financial data at risk, just names and email addresses" "M&S blames customer data leak on a 'technical issue' Says it didn't suspend its website because it was hacked." "I had, having worked for Silicon Valley tech firms and Canary Wharf banks, a brief dealing with some people in M&S IT many, many years ago. The individuals I spoke with seemed to have a very high opinion of their own abilities. I will say no more." "That M&S website has been a disaster from the first day of code" "Serious problem with my online account - showing someone else's full personal details and order history"	"Email data leak linked to Texas company that was recently breached. This is not just data loss; this is M&S data loss" "Another Useless Company Like TalkTalk, Both Must pay Peanuts to their IT team, It's More Than Scandalous!." "Many of these large companies are directed and managed by those who are technologically illiterate. They need to priorities employing computer experts who know what they are up to." "Someone I knew at M&S told me years ago that they were outsourcing their IT work to India. How many of our leading companies are allowing their IT work to be done by sources not directly under their control." "No they result from poor specification of the requirement, inadequate analysis, poor design, The Agile Method of development, stunted testing, project overruns, panic from management to get something out of the door, and nobody in India having any context in what they're working on. IT is a shambles in this country; the country is awash with genuine experts who are priced out by inadequate cheap labor offshore."	"M&S want people to come back and shop with them... Absolutely no chance after this, the online website was bad enough to navigate let alone other people's details come up etc." "I used to be a valued customer but no more. I will move my custom to Harrods." "I still get M&S staff discount showing on website even though I left a year ago! Don't buy anything though. Might give it a go see if it works!" "These companies must start putting more money into technology instead of bonuses and entertainment expenses." "I had an M&S Sparks card thrust in my hand when I paid a rare trip to purchase socks from the Westfield Stratford branch last week. I have not registered it online yet and following this report I won't bother now"	"Data security an issue as evidenced by the latest **M&S** accounts **data leak** after launch of #Sparks #OCConnected" "London-based retailer suspends website but denies it's been hacked" "Customers claim they can see order histories and addresses of others" "Happened when they logged on to register new 'Sparks' reward cards" "Companies are relying on their own software staff to put in security features into their systems. ALL companies need to ignore the pride of their systems staff and consult good track record companies that specialize in cyber security. This is long overdue as breaches are happening almost daily. If kids can breach systems - imagine what some mischievous external countries / companies can do." "Marks and Spencer living off the past glory, now a poor overpriced poor quality me to retailer, after the data breach." "We need to introduce custodial sentences for managers that outsource to incompetent oversee IT providers; the risk to our data is huge. Why fine innocent shareholders?" "Another example of poorly developed, untested software dumped into the live environment by cheap incompetent outsourcers from abroad, that will actually cost more money to fix than it saved. How surprising!" "It's interesting that M&S seems to think that having a hopelessly corrupted database is somehow better than having been hacked! There is still an issue of people being able to access others' accounts without any kind of control over whom it is!"

Prior to the website suspension, it seems that when M&S customers logged into the website, they could see other people's orders. And some customers reportedly claimed they could see payment details of other customers. However, M&S insisted that as the details were encrypted there was no security risk.

The results shown in Section IV indicate that customers have concerns about the services provided by M&S following their customer's data leak on digital media. While looking at the feedback of the customers, M&S has run into a number of problems after the data leak and it has an impact on their business. As a valued and big organization, it had to rely on the proper interworking of the content management and product management aspects of customer's personal details. The customer's issues are not limited to the breach of their personal data but also its misuse by hackers. So what could have been a successful innovation may have become a problematic system for the organization launching it, because the complex nature and form of privacy concerns within digital environments are not well understood.

Our study shows that the introduction of digital innovative cloud based model should have been carefully planned with the involvement of all the stakeholders ensuring the minimization of risk for its users – this could be due to lack of awareness of the tool, lack of understanding of configuration or the significance of integration of the tool and scope of tool's tracking ability. Our study also shows the need to fully understand the privacy concerns and needs in a meaningful

way. Understanding of potential causes of privacy anxiety and then devising strategies to minimize them could potentially lead to smooth adoption of appropriate links and presence with the digital communities using cloud based business technologies. The organizations should be aware of the concerns relating to privacy issues as a fundamental part of their new digital innovative cloud business model, especially in the environment of integrated services and tools.

VI. Conclusion

This study investigated the underlying factors causing anxiety over the data leak in M&S IT system. The conceptual formation of the research topic could be used by the decision makers, planners, designers and academics when integrating cloud based business innovative models or similar services into their systems. The study shows that understanding the users' privacy concerns is extremely important and not doing so could lead to dissatisfied users and damage to the reputation of the organization. For example, this study shows that the data leak has caused considerable angst amongst their customers. They have shown their distrust of M&S services, including technology for managing customers' personal details, which has triggered security concerns and this has resulted in damaged to the organization's reputation.

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