



Newspaper companies' determinants in adopting robot journalism



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ARTICLE INFO

Article history:

Received 1 May 2016

Received in revised form 26 October 2016

Accepted 8 December 2016

Available online 22 December 2016

Keywords:

Robot journalism

Newspaper

Determinants of the adoption

Employment strategy

C-level executives

Analytic hierarchy process

ABSTRACT

This study sought to identify the determinants of chief officers of newspapers in introducing robot journalism into newsrooms. Analytic hierarchy process was employed as a methodology, and data to be analysed were obtained from 42 surveys on chief officers from 24 different newspaper companies. According to the results, a prospected business performance brought about by the introduction of robot journalism and news consumers' willingness to read robot-written news stories are top concerns among the criteria for the consideration of whether newspaper companies plan to introduce robot journalism or not. On the other hand, journalists' attitude towards robot journalism is behind considerations for business performance and changes of external market environment. Decision-makers in newspaper companies seemed to be insensitive to sunken costs with regard to the introduction of robot journalism. In terms of alternatives, a decrease in the number of human journalists after the adoption of robot-writers is most likely to be selected as an employment strategy by newspaper companies. The fall in the number of human journalists after adopting robots is most likely to be selected as an employment strategy.

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1. Introduction

Newswriting has always been a thriving form of communication among people. However, with the technological development of today, robots are now trying their mechanical hand in writing news stories. Referred to as robot journalism, robots are now capable of writing news articles autonomously according to human-programmed algorithms (Clerwall, 2014; Latar, 2015). These robot journalists identify trends or patterns and publish articles through retrieved individual data in certain formats. In fact, the prevalence of robot journalism is currently under heavy discussion, and the future of robot journalists is seen as promising (Gani & Haddou, 2014; Taibi, 2015).

However, robot journalism will not become prevalent naturally; it would need to be selected by media organizations for its 'soft landing' in the media industry or, otherwise, robot journalism would remain stagnant. In this regard, it is essential to find out what and how decision-makers in the organizations consider robot journalism; because they could serve as significant factors to influence organizational judgments about the introduction of the new technology. Nevertheless, until now, there have been few discussions about it.

With this, this study focuses on a decision-making structure of C-level decision-makers in newspaper companies. Strategic decisions made by chief officers of newspaper companies have some effects on their respective organization's response in adapting to the changing technological environment (Herbert & Deresky, 1987; Kraatz & Zajac,

1996; Westphal et al., 1997). Hence, to illuminate the decision-making structure applied to the introduction of robot journalism contributes to the identification of concerns and issues, which may arise with the spread of robot journalists. Therefore, first, this study focuses on identifying what the primary concerns of newspapers executives are in employing robot journalists in their editorial bureau.

Secondly, this study aims to explore which alternative will be selected after the introduction of robot journalism. All around the industry, the most sensitive issue on robots has been the displacement of human labor forces because of robots; indeed, the media industry is no exception. Newspapers' chief officers, who already introduced robot writers, repeatedly have disagreed with the idea that the robots will replace human journalists. Nevertheless, journalists have been concerned about the fear of losing their jobs (BBC, 2014; Colford, 2014; Oremus, 2014). Thus, this study attempts to explore how the number of human journalists changes after the introduction of robot journalism.

To draw solutions about the research topics, this study employed analytic hierarchy process (AHP) as a methodology.

2. Literature review

2.1. Robot journalism

Historically, the term robot has two definitions: the first one is an autonomous action, and the second one is the ability to replace human labor. The term 'robot' was first used in Rossum's Universal Robots, a scenario written by a Czech author, Karel Čapek, in 1920. In the scenario, robots were used to refer to "automatic laborers of organic origin"

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(Robert, 2002). An actual word in the Czech scenario is *robota*, which means forced labor in the feudal age. According to the International Organization for Standardization (ISO), a robot is defined as an “actuated mechanism programmable in two or more axes with a degree of autonomy, moving within its environment, to perform intended tasks”. Based on their intended application, robots are divided into two groups: industrial robots and service robots. Robot journalists are seen as industrial service robots, because they produce products (news contents) in the media workplace.

In media studies, the term robot was first used by Lee and Kim (1998), who proposed a news-on-demand service system in which an algorithm collects daily news according to user’s preference registered in advance and delivers them to customers through an algorithm. The algorithm is a program designed for retrieving data from the web in pursuit of customized services (Latar, 2015; Lee & Kim, 1998).

Robot journalism is a type of advanced computer-assisted reporting (CAR). According to Green (1994), CAR was defined as “the use of database programs, spreadsheets and statistical packages to interpret information”. However, among media researchers, there is a general consensus on the fact that the idea that paved the way for the development of methods based on computers originated from CAR. The significant difference between computational journalism¹ and robot journalism lies in their autonomy. A robot journalist is not a passive agent that strictly follows only the assigned orders by human reporters; rather, it is a kind of journalist who is an active member in the news generating process that carries out its duties on its own. Once a program is inserted into the relevant software and powered up, the robot conducts its own mission without human intervention according to its algorithm. Therefore, this study defines robot journalism as a method in which a robot autonomously analyses data and produces articles based on given algorithms after being programmed by humans.

Robot journalism contributes to strengthening the competitive intelligence of newspapers. In the case of newspaper companies that already ‘hired’ a robot writer in their newsrooms, it has conducted to produce news articles by utilising information from a given data pool. As a consequence, a human journalist is no longer a sole news-writer, and, thus, its role will be inevitably changed.

Until now, news items covered by algorithms have been confined to data in specific areas such as finance, real estate, sports game and crime. Such things reflect the two characteristics of robot journalists. First, they are based on objective and concrete data. Second, when it comes to a report regarding them, speed and accuracy are primary virtues, whereas depth is a secondary consideration. According to Schramm (1949), news stories are categorized into two groups: immediate news and delayed reward news. The former requires no additional experience or necessary consideration while the latter demands endurance of unpleasantness or annoyance for its understanding. Present robot journalists have been expected to cover the immediate news.

The era of the *N-screen*² would welcome a time in which robot writers are assigned with additional roles, and mobile vehicles, such

as smartphones, are further diversified.³ The mobile war front has extended to smartwatches. The screen on the smartwatch is too small to display long news stories; instead, quick and dirty news is enough to satisfy smartwatch users. This task fits the ability of robot journalists. The diversification of smart gadgets with a small screen would raise the necessity of robot journalists in the news media industry.

Not a few of newspaper companies already introduced robot journalism. The Los Angeles Times (LA Times) is a representative case, in terms of robot journalism. LA Times has a non-human writer, which has been responsible for writing news reports about local earthquakes, named Quakebot, whose role is to extract relevant data (size, location, time) from the US Geological Survey (USGS) and insert them into a writing template (Levenson, 2014; Oremus, 2014; Shadbolt, 2015). In this process, Quakebot judges if magnitude data is newsworthy. If the magnitude exceeds 6.0, Quakebot will upload its report as a blog post of LA Times. Otherwise, a human editor determines whether to post it or not (Dickey, 2014).

2.2. Institutional entrepreneurship and structural inertia

When an organization faces the decision on whether to introduce a new technology or not, such decisions are divided into two ways: acceptance or rejection. Of the previous two, this study first discusses a dynamic force of the acceptance. It is an institutional entrepreneurship, which is referred to the activities of agents “who have an interest in particular institutional arrangements and who leverage resources to create a new institution or to transform the existing one” (Maguire et al., 2004). Institutional entrepreneurs “lead efforts to mobilize constituencies and spread collective attempts to new beliefs, norms, and values into social structures” (Rao et al., 2000).

In the previous literature dealing with institutional changes, there has been a consensus about the role of institutional entrepreneurship as a main factor in the process of the introduction of new technology (Hardy & Maguire, 2008). Institutional entrepreneurship towards an advanced technology results from the pursuit of the improvement of organizations’ competitiveness in the field through the enhancement of organizational effectiveness and health (Ashkenas et al., 2014; Beckhard, 1969; Hannan & Freeman, 1984). The purpose of the introduction of the new technology is to gain opportunities derived from the challenge (Hannan & Freeman, 1984).

This logic also serves as a justification for rejecting new technologies. Even if it does not accept the new technology, every organization has already its own way to replace it. This method is called a routine or a habit, which is regarded as a clear and safe way to obtain efficiency and gain stability for an organization (Stinchcombe & March, 1965)—an alternative to the introduction of new methods. Hence, to understand the resistance towards the introduction of new technology, it is necessary to analyse a routine or a habit (Lewin, 1947). A habit or a routine shared in a group becomes taken for granted as “rulelike status” (Meyer & Rowan, 1977). If previous customs and traditions led to any accomplishments, they would soon gain legitimacy as ‘consistent methods’ to be further used in an organization. The accomplishments place them as governing factors to constrain individual judgments in conducting organizational tasks (Hannan & Freeman, 1984; Howard-Grenville, 2005; Scott, 2001). An organization often demonstrates that it naturally inclines to rely upon any means, which were once verified by previous experiences; this tendency is referred to as ‘structural inertia’ (Hannan & Freeman, 1984). Structural inertia tends to be influenced by sunken costs, political dynamics in an organization, and a tendency to follow precedents (Hannan & Freeman, 1984). Compared with institutional

¹ Computational journalism is referred to as a series of activities that deal with computers for detecting topics, video analysis and visualization (Cohen et al., 2011; Daniel & Flew, 2010; Parasie & Dagiral, 2012). According to the definition of Hamilton and Turner (Hamilton & Turner, 2009), the most widely cited source in related studies, computational journalism has served as a tool employed for supplementing the accountability function of journalism by combining algorithm, data and knowledge from the social sciences. Aside from computational journalism, a method of sifting through Web sites for appropriate data through the use of a computational algorithm has various names: computational exploration in journalism (Gynnild, 2014), data journalism (Fink & Anderson, 2014), data-driven journalism (Parasie & Dagiral, 2012) or algorithmic journalism (Anderson, 2013). The terms are subject to researchers’ area of focus. Similarly, while algorithmic journalism is a term that stresses an algorithm in the process of sifting out big data, data journalism centers upon dealing with data.

² The term *N-screen* is a coined term that combines *N* and *screen*. *N* connotes the scalability of screens, which affords to provide users seamless content services regardless of the number of linked devices (Ha et al., 2010; Kim et al., 2012).

³ In terms of news consumption in South Korea, from 2011 to 2014, the ratio of news consumers using the Internet via mobile devices increased from 19.5% to 59.6%. During the same period, the portion of printed newspaper users decreased from 44.6% to 30.7% (Korea Press Foundation, 2014).

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