Web 2.0 use by librarians

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ABSTRACT

The current research explores whether librarians, whose main work focuses on information, are familiar with new technological changes and innovations, and whether they make use of different Web 2.0 applications. The research examines whether personality characteristics (resistance to change, cognitive appraisal, empowerment and extroversion or introversion), as well as computer expertise, motivation, importance and capacity towards studying and integrating different applications of Web 2.0 in future, influence librarians' use of Web 2.0. Different questionnaires were distributed to 168 randomly Israeli librarians throughout the country. The research revealed that personality characteristics as well as computer expertise, motivation, importance and capacity towards studying and integrating different applications of Web 2.0 in the future, influence librarians' use of Web 2.0. These findings have theoretical as well as practical implications.

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1. Introduction

The term *Web 2.0* was coined and conceptualized by Tim O'Reilly and Dale Dougherty in 2004 to describe the terms and business models that survived the technology sector market crash in the 1990s (O'Reilly 2005). There are five main characteristics of Web 2.0:

1. User generated content (UGC), which refers to self-publishing, personal publishing, and self-expression (Downes, 2004)
2. The wisdom of crowds: the theory that groups operating according to certain conditions can solve problems more effectively than even the most intelligent individual member of the group
3. Sharing information
4. Network effect, an economic term used to describe the increase in value to existing users of a service, as more people start to use it (Klemperer, 2006)
5. Openness: working with open standards, using open-source software, making use of free data, re-using data, and working in a spirit of open innovation (Anderson, 2007).

The library and information science (LIS) community has often discussed Web 2.0. Stephens (2006) asserted that many people associate it with terms such as blogs, wikis, podcasts, RSS feeds, and social web. He claimed that Web 2.0 is a place where everyone can add or edit information and where digital tools allow users to create, change, and publish dynamic content. For Miller (2006), Web 2.0 is participative and presents the value of user-generated content. It is about sharing and communication; it opens the long tail that allows small groups of individuals to benefit from key pieces of the platform while fulfilling their own needs.

2. Problem statement

Web 2.0 is becoming a central topic in our information world. This study aims to explore whether librarians whose work focuses on information are familiar with the new technological innovations and whether they use different Web 2.0 applications. Do librarians understand the power of Web 2.0 opportunities? Do they investigate and ultimately adopt new tools? Do librarians use non-traditional cataloguing and classification and recognize the idea of the "long tail"? Do they develop social networks and encourage users to develop content and metadata? Do they understand the "wisdom of crowds" and the new roles of the blogosphere and wikisphere?

The research will examine whether librarians' use of Web 2.0 is affected by personality characteristics (resistance to change, cognitive appraisal, empowerment, and extroversion or introversion) and computer expertise, motivation, importance, and inclination toward studying and integrating different applications of Web 2.0 in the future. This research may contribute to the theoretical and practical implications of understanding how individual differences affect librarians' acceptance of technology. It may also lead to further research in this field.

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3. Literature review

3.1. Resistance to change

Researchers have investigated resistance to change on individual and organizational levels. There was limited research on the individual level until the past two decades, when research began to focus more on the psychological perspective and on the individual in investigating the processes of organizational change. Judge, Thoresen, Pucik, and Welbourne (1999) linked several personality traits to a work-oriented concept of coping with change. These traits combined two factors: the Positive Self-concept factor and the Risk Tolerance factor. Judge et al.'s research indicated that coping with organizational change was related to extrinsic career outcomes (salary, job level, plateauing, job performance) and intrinsic career outcomes (organizational commitment, job satisfaction). Wanberg and Banas (2000) identified five variables likely to affect employees' openness towards change: receipt of information about the change, participation in the change process, change-specific self-efficacy, available social support, and the impact of the change upon the individual. Campbell (2006) addressed learning orientation and found that a high learning orientation is associated with a more positive attitude towards change. Oreg (2003) designed a scale based on individual differences that measured resistance to change. He identified four factors related to the individual's personality that can cause resistance to change: (1) routine seeking: a preference for routine over changes in life; (2) emotional reaction to imposed change; (3) short-term focus: the immediate inconvenience effects of a change; and (4) decisiveness: the ease and frequency with which individuals change their minds. Aharony (in press) used Oreg's scale and asserted that librarians who are willing to change reveal more pro-marketing attitudes and perform more activities in order to market the library. Another study examined Web 2.0 use by library and information science (LIS) students (Aharony, 2008). This study found that the more resistant to change the students are, the less they are motivated to learn about Web 2.0, the lower their capacity to use it, and the less they use Web 2.0.

3.2. Cognitive appraisal: Threat versus challenge

The Lazarus stress theory refers "to a relationship with the environment that the person appraises as significant for his or her well being and in which the demands tax or exceed available coping resources" (Lazarus and Folkman, 1986, p. 4). This definition portrays two central processes that are very important to the person-environment relationship: cognitive appraisal and coping. Cognitive appraisal refers to the individual's evaluation of the significance of events for his or her well-being. Coping refers to the individual's efforts in thought and action to manage specific demands (Lazarus, 1993).

According to Lazarus (1966), evaluation of any situation can be divided into primary and secondary appraisals. A primary appraisal examines the nature of the stimuli and determines whether the event is to be viewed as irrelevant, positive, or stressful. Stressful appraisals can take three forms: harm, threat, or challenge (Lazarus and Folkman, 1984). Harm refers to psychological or physiological damage that has already occurred; threat refers to potential future harm and is accompanied by fear (Lazarus, 1991; Lazarus and Folkman, 1984). Challenge pertains to situations in which people see potential for gain or benefit. The emotions associated with challenge are excitement, eagerness, happiness, and joy (Lazarus, 1991). In secondary appraisals, "the individual compares the demands of the situation with his or her resources to determine his or her coping potential specific to the situation or event" (Lonsdale and Howe, 2004, p. 8).

The current research focuses on the appraisal concept, which is a key factor for understanding stress-relevant transactions. It emphasizes the emotional processes that accompany a person's expectations

of the significance and outcome of a specific encounter. The appraisal concept may explain individual differences in coping with emotions in environments that are objectively similar. Some researchers (Blascovich, Mendes, Hunter, and Lickel, 2000), have referred to *threat* and *challenge* as motivational states that result from the individual's evaluation of situational demands and personal resources. Threat takes place when the individual evaluates the situation and finds that resources do not meet situational demands. Challenge occurs when the individual finds that resources meet situational demands. Examining the literature reviews reveals that seeing a threat suggests potential danger to one's well-being or self-esteem (Lazarus, 1991; Lazarus and Folkman, 1984; Rapee and Heimberg, 1997; Sarason and Sarason, 1990). Those who experience anxiety in stressful or social situations, such as in tests and sports, anticipate failure and negative evaluations. This threatens self-identity and self-esteem (Beck, Emery, and Greenberg, 1985; Rapee and Heimberg, 1997; Schlenker and Leary, 1982; Wilson and Eklund, 1998). Conversely, people who view a situation as a challenge portray confidence that the demands of a stressful situation can be overcome (Lazarus, Kanner, and Folkman 1980; Park and Folkman, 1997). Those people focus on opportunities for success, social rewards, and personal growth (Lazarus, 1991; Lazarus and Folkman, 1984; Lazarus, Kanner, and Folkman, 1980). Several studies (Blascovich et al., 2000; Blascovich and Tomaka, 1996; Tomaka, Blascovich, Kelsey, and Leitten, 1993; Tomaka, Blascovich, Kibler, and Ernst, 1997) have supported Lazarus (1991) theory that challenge was associated with higher coping expectations, lower subjective stress, and generally higher perceptions of themselves and their success.

According to social psychologists, challenge and threat are context bound and occur only in motivated performance situations. These situations are relevant to the person's goals, require instrumental cognitive responses, and are active (Blascovich, Mendes, Hunter and Lickel, 2000). Examples of motivated performance situations are delivering a speech, taking a test, getting involved in interpersonal negotiations, and performing a task competitively. Tomaka, Blascovich, Kelsey and Leitten (1993) claimed that individuals with higher demands relative to resource appraisals were characterized as threatened and those with lower demands relative to resource appraisals were characterized as challengers. In addition, Tomaka, Palacios, Schneider, Colotla, Concha, and Herrald (1999) found that high assertive women's stress-related reactions indicated challenge, whereas the low assertive women's reactions indicated threat. The Lazarus model of appraisal is widespread in sport psychology (Lazarus, 2000) and in education (Oermann and Standfest, 1997; Sirsch, 2003).

3.3. Empowerment

Empowerment has been the focus of increasing interest among theorists and practitioners (Conger and Kanugo, 1988). In the workplace, empowerment is the process of enabling workers to set their own goals, make decisions, gain work experience, and solve problems within their responsibility and authority (Liden, Wayne, and Sparrowe, 2000; Litterll, 2007).

The literature indicates two main approaches to empowerment: 1) relational and 2) cognitive or motivational (Ergeneli, Ari, and Metin, 2006). The relational approach emphasizes environmental elements. It defines empowerment as a set of managerial activities and practices that give employees power, control, and authority (Bennis, 1984). This approach stresses transmitting organizational power to the less powerful by increasing employees' participation in decision-making processes and encouraging employees to participate actively in the organization.

The cognitive or motivational approach stresses the idea of psychological empowerment; helping employees perceive that they are empowered (Thomas and Velthouse, 1990). The cognitive approach encourages open communication and emotional support to reduce

stress and anxiety. It aims to increase loyalty, participation, and employees' feeling of self-efficacy (Hardy and O'Sullivan, 1998). Conger and Kanugo (1988) relied on Bandura's (1986) definition of self-efficacy and suggested that "empowerment refers to a process whereby an individual's belief in his or her self-efficacy is enhanced" (p. 474). Thomas and Velthouse (1990) suggested that empowerment is a multidimensional construct. They defined it as increased intrinsic motivation manifested in four cognitions that reflect individual's orientation to his or her work: meaningfulness, competence, choice, and impact. Spreitzer (1995) defined empowerment using four similar cognitions – meaning, competence, self-determination, and impact – that convey a feeling that a person is able to influence his or her role and context.

Empowerment comprises both environmental and individual elements. Robbins, Crino, and Fredendall (2002) stated that the interaction between environmental elements and personal cognition, perceptions, and attitudes constituted empowerment. Spreitzer (1995) found external factors that contribute to empowerment include sociopolitical support from subordinates, work groups, access to information, and a work climate focusing on participation. In a later study, (Spreitzer, 1996), he also suggested six characteristics of work unit social structure that facilitate empowerment: low role ambiguity, working for a manager who has a wide span of control, sociopolitical support, access to information, access to resources, and a participative unit climate. Thomas and Velthouse (1990) asserted that empowerment also depends on contextual factors, such as employees' interactions with superiors, peers, and subordinates.

3.3.1. Empowerment and libraries

The library and information science (LIS) references to empowerment can be classified into four categories: community empowerment, worker and manager empowerment, empowerment of technology, and client empowerment (Cavanagh, 2001). According to Maack (1997), the empowered library professional is engaged in knowledge sharing, collaborates in decision making, and directs library clients towards autonomy. Carson, Schouest, Hanebury, and Carson (1996) stated that library employees who perceive themselves as more empowered will report high levels of job satisfaction and lower levels of job withdrawal intentions.

Two researchers (Estrin, 1998; Pavey, 2005) suggested that librarians who explain, instruct, and teach concepts enhance their image and situation. They empower themselves as they provide techniques and methodologies for handling various situations and master technology. Morgan (1997) expanded on this theory, saying that computer technology empowers librarians, provides solutions, and expands the horizon of library services. Brock and Kirby (2001) assumed that the use of electronic tools contributes to the librarians' professional growth and to their professional lives. In his study of academic libraries, Littman (1995) proposed that an academic librarian who understands videoconferencing strategies, techniques, and applications is empowered and can enrich library services. Aharony (in press) noted that empowered librarians reveal more pro-marketing attitudes and perform more activities to market the library.

3.4. Extroversion and introversion

The extroverted and introverted characteristics are part of personality theory. These characteristics highlight the type of environment in which people feel most comfortable and work best (Furnham and Springfield, 1993). Extroverts feel comfortable with people and things, introverts with ideas. Extroverts express emotions, and introverts do not. Introverts tend to focus on internal thoughts rather than external stimuli. Introverts are more socially anxious, inhibited, and often quiet (Dawaele and Furnham, 2000; Furnham and Springfield, 1993). They display more pronounced cortical arousal to stimuli and lower scores on short-term memory performance (Eysenck, 1991;

Eysenck and Eysenck, 1985). Beatty, McCroskey, and Heisel (1998) claimed that introverts who are anxious when communicating may have an overactive behavioral inhibition system.

Researchers have studied the relationship between personality type and selecting an appropriate career. The Myers-Briggs Type Indicator evaluates individuals' personality by surveying their preferences, which are then used to determine the type of career most suitable for them (Kroeger and Thuesen, 1989). Kroeger and Thuesen (1989) claimed that people tend to work in environments that are pleasing and comfortable for them. Thus, extroverts tend to choose careers with a great deal of social interaction and human contact (e.g., marketing, retail sales, acting, teaching, journalism, and heath care), while introverts tend to choose careers that require more solitary work (e.g., accounting, library sciences, clergy, science, computer analysis, farming, and engineering). Furthermore, Broday and Sedgwick (1991) found that introversion was related to realistic and investigative occupations, and that extroversion was related to social and enterprising occupations. Recent research (Aharony, in press) found that librarians who are more extroverted reveal more pro-marketing attitudes.

4. Hypotheses

1. The more resistant to change librarians are, the less they use Web 2.0.
2. The more challenged librarians are, the more they use Web 2.0, and the more threatened they are, the less they use it.
3. The more empowered librarians are, the more they use Web 2.0.
4. The more extroverted librarians are, the more they use Web 2.0.
5. High scores in librarians' computer expertise, motivation, importance, and capacity will be associated with high scores in librarians' Web 2.0 use.

5. Procedures

The research was conducted during the summer semester of the 2007 academic year. It encompassed three main groups of Israeli librarians: school librarians, public librarians, and academic librarians. The researcher sent 200 questionnaires via mail and 50 online questionnaires to randomly selected librarians who work in central libraries in the north, south, and center of Israel. Of this group, 168 librarians answered the questionnaires. Seventeen respondents (10.8%) were male and 140 (89.2%) were female. Most ($n= 58$, 35.8%) were 51–60 years old, and the youngest age group (20–30) was also the smallest ($n= 14$, 8.6%). As far as work experience, 39 (25.8%) had been librarians for more than 20 years, and 97 (76.4%) had a bachelor's degree. Their places of employment were divided between school libraries ($n= 17$, 10.3%), public libraries ($n= 54$, 32.7%), and academic libraries ($n= 94$, 57%). Respondents were library managers ($n= 27$, 16.1%) and librarians ($n= 141$, 83.9%).

The study used ten questionnaires: a personal details questionnaire, a resistance to change questionnaire (Questionnaire A), a cognitive appraisal questionnaire measuring threat versus challenge (Questionnaire B), an empowerment questionnaire (Questionnaire C), extroversion/introversion questionnaire (Questionnaire D), a Web 2.0 use questionnaire (Questionnaire E), a computer expertise questionnaire (Questionnaire F), a questionnaire on the importance of studying and integrating different applications of Web 2.0 in the future (Questionnaire G), a motivation questionnaire (Questionnaire H), and a capacity questionnaire (Questionnaire I) (See Appendix A).

The resistance to change questionnaire (Questionnaire A) consisted of 12 statements rated on a 6-point scale (1 — disagree; 6 — agree). This questionnaire was previously validated (Aharony, in press; 2008; Oreg, 2003). Its alpha Cronbach coefficient was .87.

The cognitive appraisal questionnaire measured librarians' feelings of threat versus challenge when confronted with new situations (Questionnaire B). It consisted of 10 statements rated on a 6-point

scale (1 − disagree; 6 − agree). This questionnaire was previously validated (Aharony, 2008; Yekutiel, 1990). It consisted of two factors: threat (6 items) and challenge (4 items). The alpha Cronbach was .86 for the threat factor and .79 for the challenge factor.

The empowerment questionnaire (Questionnaire C) consisted of 12 statements rated on a 5-point scale (1 = disagree; 5 = agree). This questionnaire was previously validated (Aharony, 2008). Its alpha Cronbach coefficient was .92.

The extroversion/introversion Eysenck questionnaire (Questionnaire D) consisted of 24 questions to which participants gave yes/no answers. This questionnaire was previously validated (Aharony, in press; Kaniel, 1975), and its alpha Cronbach coefficient was .75.

The Web 2.0 use questionnaire (Questionnaire E) consisted of five yes/no questions focusing on whether or not respondents used the Web 2.0 applications listed. Scores were aggregated into one measure according to the number of applications the respondents used. The higher the respondent's score, the more he or she used Web 2.0. The alpha Cronbach coefficient for this questionnaire was .66.

Respondents' scores on the questionnaires about computer expertise, the importance of studying and integrating different applications of Web 2.0 in the future, motivation, and capacity were aggregated into one measure according to the mean score for each item. Higher scores indicated more computer expertise, importance, motivation, and capacity.

The computer expertise questionnaire (Questionnaire F) consisted of four statements relating to Microsoft® Office software (Word, PowerPoint®, Excel®, and Access). The respondents' scores were rated on a three-point scale (1 − low; 3 − high). The alpha Cronbach coefficient for this questionnaire was .76.

The importance questionnaire (Questionnaire G) included nine statements that reflected the importance of studying and integrating different applications of Web 2.0 in the future. The respondents' scores were rated on a five-point scale (1 − not important at all; 5 − very important). The alpha Cronbach coefficient was .88.

The motivation questionnaire (Questionnaire H) consisted of six statements pointing to the level of motivation to learn Web 2.0 applications. The respondents' scores were rated on a five-point scale (1 − disagree; 5 − agree). The alpha Cronbach coefficient for the motivation was .95.

The capacity questionnaire (Questionnaire I) consisted of six statements aimed at examining the respondents' capacity to master the different applications of Web 2.0 in the future. The respondents' scores were rated on a five-point scale (1 − disagree; 5 − agree). The alpha Cronbach coefficient was .93.

6. Results

Table 1 presents the Pearson correlations across the variables of importance, motivation, appraisal and Web 2.0 use. It also shows the means and standard deviations of different measures of Web 2.0 use.

Table 1
Pearson correlations among importance, motivation, appraisal and Web 2.0 use, and means and standard deviation of different measures toward Web 2.0 use

	Importance	Motivation	Capacity	Threat	Challenge	Web 2.0 use
M	3.85	4.02	2.36	1.75	3.98	2.36
SD	.81	.91	1.29	.78	1.06	1.29
Importance	–					
Motivation	.56***	–				
Capacity	.49***	.33***	–			
Threat	−.22**	−.12	−.38***	–		
Challenge	.42***	.48***	.33***	.02	–	
Web 2.0 use	.44***	.40***	.47***	−.20**	.34***	–

**$p < .01$.
***$p < .001$.

Table 2
Means and standard deviation of librarians' attitudes towards Web 2.0 use according to computer expertise

Measures	Computer expertise							
	Low		Medium		High			
	M	SD	M	SD	M	SD	F (2,150)	eta²
Importance	3.76	.82	3.86	.83	4.02	.68	.72	.01
Capacity	3.31	.92	3.91	.79	4.24	.97	10.01***	.12
Motivation	3.76	.88	3.99	.93	4.38	.80	3.41*	.04
Threat	2.13	.85	1.63	.68	1.50	.76	7.27***	.09
Challenge	3.92	.95	3.97	1.07	4.10	1.29	.20	.00
Web 2.0 use	1.72	.91	2.54	1.26	3.22	1.44	11.27***	.13

*$p < .05$.
***$p < .001$.

Significant correlations were found for all five measures. Four measures were positive (importance, motivation, capacity, and challenge); only the threat measure was negative. The more the librarians are motivated, the more they think Web 2.0 is important, and the more they feel capable to handle Web 2.0. The more they use it, the more they perceive Web 2.0 as challenging instead of threatening. Table 1 also shows that the mean of the challenge is higher than the mean of the threat. T-tests show a significant difference between the two means: $t = 2.73$, $p < .001$. The mean of Web 2.0 use variable is low in regard to a 5-point scale ($M = 2.36$, $SD = 1.29$). This reflects that librarians do not often use Web 2.0.

In order to examine the relationship between personal characteristics (gender, academic degree, workplace, and position) and variables reflecting librarians' attitudes towards Web 2.0 use (importance, capacity, motivation, threat and challenge, and Web 2.0 use), a MANOVA was performed for each measure separately. The test did not reveal any significant differences. Univariate ANOVA for each measure separately revealed a significant difference regarding position: $F(1,154) = 8.71$, $p < .01$, eta² = .05. The ANOVA test further revealed that library managers use Web 2.0 more ($M = 3.12$, $SD = 1.30$) than librarians ($M = 2.31$, $SD = 1.26$). Pearson correlations were also performed for age and number of working years. There were no significant correlations between librarians' age and number of working years, or between age, number of working years, and variables that reflect librarians' attitudes towards Web 2.0 use.

Looking at librarians' level of computer expertise shows that 26% defined themselves as having a low level of computer expertise, 59.4% as having a medium level of computer expertise, and only 14.9% as having a high level of computer expertise. In order to examine the relationship between computer expertise and librarians' attitudes towards Web 2.0 use, a one-way MANOVA was performed. This analysis showed a significant difference: $F(12,290) = 3.83$, $p < .001$, eta² = .14. Table 2 presents the means and standard deviation of the different variables and the results of a univariate ANOVA for each measure separately.

The results of a univariate ANOVA for each measure separately revealed significant differences in regard to all measures except importance and challenge. Table 3 indicates that the higher the level of librarians' computer expertise, the more positive their attitudes are towards Web 2.0 use and the more they use Web 2.0.

In order to examine the correlation between personality characteristics (extroversion, change, and empowerment) and librarians' attitudes towards Web 2.0 use (importance, capacity, motivation, threat and challenge, and Web 2.0 use), researchers performed Pearson correlations. Table 3 presents the results.

Table 3 indicates the significant positive correlation between extroversion and Web 2.0 use. The more extroverted the librarians, the more they use Web 2.0. A negative significant correlation was found between extroversion and threat and a positive significant one between extroversion and challenge. The more empowered the librarians, the less threatened they are of Web 2.0 and the more they

Table 3
Pearson correlations between personality characteristics and librarians' attitudes towards Web 2.0 use ($N=168$)

Measures	Importance	Motivation	Capacity	Threat	Challenge	Web 2.0 use
Extroversion	.07	.04	.12	−.14	.10	.21**
Empowerment	.11	.09	.07	−.21*	.17*	−.02
Change	−.23**	−.22**	−.12	−.34***	−.14	−.26**

 *$p<.05$.
 **$p<.01$.
***$p<.001$.

feel challenged by Web 2.0. Negative significant correlations were found between change and all measures except capacity and challenge. The more resistant to change the librarians, the lower their motivation to learn about Web 2.0, the less importance they attribute to it, the more threatened they are of it, and the less they use Web 2.0.

Researchers conducted a hierarchical regression analysis using Web 2.0 use as the dependant variable. The predictors were entered as four steps: 1) the personal characteristics of position and computer expertise 2) the personality characteristics (extroversion, empowerment, and change) 3) the librarians' attitudes towards Web 2.0 use (importance, capacity, motivation, threat and challenge, and Web 2.0 use), and 4) interactions between the research variables. This regression explained 49.8% of Web 2.0 use.

An examination of the first step (personal characteristics) reveals that the position and computer expertise variables contributed significantly; they added 16% to the explained variance. The beta coefficient was positive. In other words, library managers use Web 2.0 more often than librarians. Participants with more computer expertise use more Web 2.0 than participants whose computer expertise is low.

The second step introduced the personality characteristics (extroversion, empowerment, and change). Only the change variable contributed significantly; it added 6% to the explained variance. The beta coefficient was negative. The less resistant to change the participants are, the more they use Web 2.0.

The third step added the librarians' attitudes towards Web 2.0 use (importance, capacity, motivation, threat and challenge, and Web 2.0 use). Only the capacity variable contributed significantly, adding 22% to the explained variance. The beta coefficient was positive. The more librarians feel capable of controlling Web 2.0 applications, the more they use Web 2.0.

At the fourth step, researchers multiplied the interactions managers by the computer expertise. Motivation times extroversion contributed significantly, adding 5% of the explained variance. In order to understand this interaction, the participants' group was divided into two sub-groups according to their position (managers or librarians). Researchers examined the correlation between computer expertise and Web 2.0 use for each group. A positive correlation was found in both groups, with a higher correlation among the librarians ($r=.38$, $p<.001$) than among managers ($r=.24$, $p>.05$). Librarians with more computer expertise make more use of Web 2.0. The second interaction that contributed significantly to the explained variance was motivation multiplied by extroversion. In order to understand this interaction, the participants were divided into three groups according to their level of extroversion. Researchers examined the correlation between motivation and Web 2.0 use for each group. Lower correlations were found among those who scored low ($r=.31$, $p<.05$) and medium ($r=.34$, $p<.05$) in extroversion than among those who were strongly extroverted ($r=.55$, $p<.001$).

7. Discussion

H1 was supported. This finding is not surprising; it echoes the professional literature finding that people resist change because of the difficulties inherent in coping with it. Individuals may feel uncertain about what the future holds, and they may be worried about job loss, new tasks, or about their psychological well-being (Ashford 1988; Schweiger and DeNisi, 1991). The research finding confirms a previous study concerning resistance to change (Aharony, 2008) that found that the more resistant to change LIS students are, the less they use Web 2.0. Furthermore, the more resistant to change the librarians are, the lower their motivation to learn about Web 2.0, the less importance they attribute to this subject, and the more they are threatened by it. In other words, librarians who resist change and do not use Web 2.0 also have negative attitudes towards the subject.

H2 was also supported. It indicated that librarians who scored highly on the challenge scale also scored highly on Web 2.0 use, while high scores on the threat scale were associated with low scores of Web 2.0 use. This result is commensurate with research on threat and challenge that shows that people who view situations as challenges are characterized by higher coping expectancies, lower subjective stress, and generally higher perceptions of themselves and their success (Blascovich and Tomaka, 1996; Tomaka et al., 1993; Tomaka et al., 1997). Conversely, those people who view situations as threats assume that there is potential danger to their well-being or self-esteem (Lazarus, 1991; Lazarus and Folkman, 1984; Rapee and Heimberg, 1997; Sarason and Sarason, 1990). In the present study, librarians who feel challenged by new technology practice the new technological innovations and use different Web 2.0 applications in their professional careers. This finding replicates another study (Aharony, 2008) in which a higher score on the challenge scale is associated with more use of Web 2.0 by LIS students.

The results pertaining to H3 demonstrate that this hypothesis was also accepted. The more empowered the librarians are, the more they use Web 2.0. This result is consistent with previous studies. Several researchers have already noted that mastering technology empowers librarians as it expands the scope of library services (Morgan, 1997) and contributes to their professional growth (Brock and Kirby, 2001). Empowered librarians feel confident in trying out and working with new technological applications — they understand that this experience will benefit them personally and professionally. Accordingly, on a personal level they will recognize and master new tools that may assist them in their dynamic work surroundings. On a professional level, the new knowledge will position their work as a job based on advanced technologies, which may improve and promote their professional images.

H4 refers to the possible association between high scores of extroversion and high scores of Web 2.0 use. Results point out that H4 was accepted; the more extroverted the librarians are, the more they use Web 2.0. This finding echoes the professional literature, which states that extroversion and introversion predict the work environment in which we feel most comfortable and work best (Furnham and Springfield, 1993). People seek employment in environments that are pleasing and comfortable for them (Kroeger and Thuesen, 1989). Extroverted librarians feel comfortable with people. They tend to focus on external stimuli and express emotions. These librarians, who see and understand the advantages of using Web 2.0 in their workplace, feel comfortable generating content on the Web, working on open platforms, exposing their thoughts to others, sharing ideas with colleagues from different places, and collaborating. The current findings (H1-H4) can be associated with Devaraj, Easley, and Crant's (2008) findings, which showed that the five-factor model of personality (FFM) was related to key dimensions of technological acceptance.

Our findings reveal that more than half the librarians define themselves as having a medium level of computer expertise. About one-third define themselves as having a low level of computer expertise, and the rest define themselves as having high level. Based on these findings, H5 was also supported. H5 revealed that among librarians, higher computer expertise is associated with higher

motivation to learn and to be familiar with Web 2.0. The more importance they attribute to it and the more they feel they are able to master Web 2.0, the greater their Web 2.0 use. These findings are encouraging; they suggest that those librarians who perceive themselves as technologically oriented will have no problems working with new technology and integrating it into their jobs. This ability, may, in turn, help them advance their personal and professional positions. These findings are similar to the results of Aharony's (2008) study, which found that the more LIS students use the computer, the more they feel capable of using Web 2.0, the higher the importance they attribute to Web 2.0 applications, the higher their motivation to study and master the technology — and the more they use Web 2.0. It should be noted that motivation contributes to Web 2.0 use, but this contribution is higher among those librarians who are more extroverted. The more extroverted librarians are, the more they are motivated to participate in this new platform of collaborating and sharing information and ideas.

Library managers use Web 2.0 more than ordinary librarians. The managers realize the potential of Web 2.0 applications and the importance of integrating them in their work surroundings. On one hand, they understand that the library should be relevant to different patrons and that using new technologies in the library may attract various kinds of crowds. On the other hand, they may perceive the professional benefits of incorporating wikis, blogs, RSS, or other Web 2.0 applications into their libraries. Library managers are more aware of technological developments and their impact than librarians; managers are ready to try new technologies and possibly include them as new services in their libraries.

8. Conclusion

This study highlighted the characteristics that affect librarians' use of Web 2.0, including personality characteristics (resistance to change, cognitive appraisal, empowerment, and extroversion or introversion), computer expertise, motivation, importance, and the capacity to study and integrate different applications of Web 2.0 in the future. These findings are commensurate with Devaraj, Easley, and Crant's (2008) research and may have theoretical as well as practical implications. On the theoretical level, the findings emphasize the importance of individual differences in technology acceptance and may lead to further research in this field. On the practical level, library directors may look for these traits when selecting new workers. The library directors may understand that the organization might benefit from hiring people with positive attitudes toward technology. Furthermore, if library directors identify workers who are inclined to have negative attitudes towards technology, they can offer training programs to help them to overcome their negative inclination. Library directors can also propose rewards to encourage them to use technology.

The information world is in a state of constant change, and Web 2.0 is playing a central part. According to this study's findings, Israeli librarians are quite exposed to these changes. They understand that in order to survive, remain relevant, attract new patrons, and be professional, they should master the newest technological applications and apply them in their changing work environment. These findings echo the professional literature (Grealy, 2000; Pollack and Brown, 1998; Stoddart, Bryant, Baker, Lee, and Spencer, 2006) that emphasizes the challenges and innovations librarians face. These innovations force the librarians to acquire new skills and attitudes and to adapt to this new and changing environment. In addition, Pollack and Brown (1998) noted that librarians report that learning during their careers should be constant; librarians use formal and informal learning methods to keep up to date with constant changes.

Further studies are needed in order to gain a more thorough understanding of the significance of librarians' personality characteristics. Future studies should include librarians from other countries in order to gain a broader perspective on Web 2.0 use.

Appendix A. Questionnaires

Personal details:

Male/Female
Age:
    20–30 31–40 41–50 51–60 over 60
Years of professional experience:
    0–5 6–10 11–15 16–20 over 20
Previous education:
Bachelor's degree in: information science/other
Master's degree in: information science/other
Doctorate in: information science/other
Other:
Role:

    Reference librarian/circulation librarian/collection and services librarian/acquisition librarian/information professional/manager of a library

Place of work:

School library/public library/academic library

Change scale

Listed below are several statements regarding general beliefs and attitudes towards change. Please indicate the degree to which you agree or disagree with each statement by marking "X" in the appropriate column of the scale (1 = *strongly disagree*, 6 = *strongly agree*).

	1 Strongly disagree	2 Disagree	3 Inclined to disagree	4 Inclined to agree	5 Agree	6 Strongly agree
1. I generally consider changes to be a negative thing.						
2. I'll take a routine day over a day full of unexpected events any time.						
3. I like to do the same old things rather than try new and different ones.						
4. Whenever my life forms a stable routine, I look for ways to change it.						
5. I'd rather be bored than surprised.						
6. If I were to be informed that there's going to be a significant change regarding the way things were done at school, I would probably feel stressed.						
7. When I am informed of a change of plans, I tense up a bit.						
8. When things don't go according to plans, it stresses me out.						

Appendix A (*continued*)

	1 Strongly disagree	2 Disagree	3 Inclined to disagree	4 Inclined to agree	5 Agree	6 Strongly agree
9. If my boss changed the criteria for evaluating employees, it would probably make me feel uncomfortable even if I thought I'd do just as well without having to do any extra work.						
10. Changing plans seems like a real hassle to me.						
11. Often, I feel a bit uncomfortable even about changes that may potentially improve my life.						
12. When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me.						

Cognitive appraisal questionnaire: Threat versus Challenge

Below are statements concerning your attitudes towards new situations. Please mark an "X" in the column that describes your accordance with the following statements (1 = *not at all*; 6 = *at a very high level*).

	1. Not at all	2. Very slightly	3. Slightly	4. Average level	5. More than average	6. At a very high level
1. A new situation stresses me.						
2. A new situation seems difficult to me.						
3. A new situation threatens me.						
4. A new situation challenges me.						
5. A new situation will harm me.						
6. I think I can benefit from this new situation.						
7. A new situation makes me angry.						
8. A new situation causes anxiety.						
9. A new situation causes certainty.						
10. A new situation enables me to show my capacity.						

Empowerment questionnaire

Listed below are several statements regarding one's place of work. Please indicate the degree to which you agree or disagree with each statement concerning your present place of work by marking an "X" in the appropriate column (1 = *strongly disagree*, 5 = *strongly agree*).

	1. Strongly disagree	2. Disagree	3. Inclined to agree	4. Agree	5. Strongly agree
1. I have a lot of freedom and independence in the library.					
2. I feel personal importance regarding my tasks.					
3. I'm sure I can fulfill my job.					
4. I have a lot of influence over what's going on in the library.					
5. My work is very important to me.					
6. I am sure I can fulfill my job properly.					
7. I can decide what I'll do in the library.					
8. I know what's going on in the library.					
9. My work is essential to me.					
10. I'm a skilled worker.					
11. I am free to make decisions in the library					
12. I have a little influence over what's going on in the library.					

Extroversion/Introversion questionnaire

Read the following questions and mark an "X" in the appropriate column.

	Yes	No
1. Are you happy when you get involved in some project that calls for immediate and rapid activity?		
2. Are you looking for new friends?		
3. Are you inclined to be quick and deliberate in your actions?		
4. Do you think you are a very lively person?		
5. Will you be sad if you don't have a lot of friends?		
6. Do you prefer acting or planning actions?		
7. When you are walking with other people, do you often have difficulty keeping up with them?		
8. Do you feel it is difficult for you to be free even in a happy party?		
9. Are you inclined to be too serious and too reliable?		
10. Are you generally very enthusiastic about being with others?		
11. Do you prefer having a few good friends?		
12. Do you often find yourself thinking about business work as business of life or death?		
13. Are you happy when you have a lot of social activities?		
14. Would you like to be the leader in social activities?		
15. Do you tend to be shy with the opposite sex?		
16. Do you always have answers to questions referring to you?		
17. Do you think you are a happy, reckless person?		
18. Are you inclined to be silent with others?		
19. Can you feel free and enjoy when you are with others?		

Appendix A (*continued*)

	Yes	No
20. Do you like work that requires a lot of attention?		
21. Do you pay a lot of attention to your work?		
22. Do other people regard you as a very lively person?		
23. Do you think you are talkative?		
24. Do you like to joke, even if you hurt others' feelings?		

Web 2.0 use questionnaire

Please mark an "X" in the column to indicate your response to the questions below.

	Yes	No
1. Do you read blogs?		
2. Do you add posts to blogs?		
3. Do you read entries in Wikipedia?		
4. Do you add entries to Wikipedia?		
5. Do you edit entries in Wikipedia?		
6. Do you take pictures from Flickr™?		
7. Do you add pictures to Flickr?		
8. Do you use RSS?		
9. Do you participate in a social network?		
10. Do you think that in the future you will use Web 2.0 applications?		

Computer expertise questionnaire

Please rate your skill level on the following programs by marking an "X" in the appropriate column.

Skill level	Low	Average	High
Microsoft® Word			
Microsoft® PowerPoint®			
Microsoft® Excel®			
Microsoft® Access			

Questionnaire about the importance of studying and integrating different applications of Web 2.0 in the future

Below you will find statements regarding the importance of studying and integrating different applications of Web 2.0 in the future. Please mark with an "X" the column that describes your attitude (1 = *not important at all*; 5 = *very important*).

	1. Not important at all	2. Not important	3. Somewhat important	4. Important	5. Very important
Web 2.0					
Library 2.0					
Content sharing					
Blogs					
Wikis					
RSS					
Social networks					
Tagging					
Instant messaging					

Motivation questionnaire

Below are statements concerning Web 2.0. Please mark with an "X" the column that describes your attitude (5 = *strongly agree*; 1 = *disagree*).

	1. Strongly disagree	2. Disagree	3. Inclined to agree	4. Agree	5. Strongly agree
1. I'm ready to study new subjects relating to Web 2.0.					
2. I'm ready to devote a lot of time to mastering Web 2.0 principles.					
3. Web 2.0 interests me a lot.					
4. I'm ready to make many efforts to master this subject.					
5. Understanding Web 2.0 is very important to me.					
6. I'll be very happy to know this subject in depth.					

Capacity questionnaire

Below are statements concerning Web 2.0 applications. Please mark with an "X" the column that you think describes your capacity to master each application (1 = *very low*; 5 = *very high*)

	1. Very Low	2. Low	3. Moderate	4. High	5. Very High
Blogs					
Wikis					
Flickr™					
RSS					
Social networks					
YouTube™					

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