‘Remember the Sabbath’: A history of technological decisions and innovation in Orthodox Jewish communities

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Abstract: The relationship of Modern Orthodox Jewish communities to technology is mediated by the calendar, following requirements to keep the Sabbath holy. As nineteenth, twentieth, and twenty-first century inventions reshaped work, public spaces, and domestic living, rabbis intensely debated whether, how, and why observant Jewish people should avoid using electric switches, kitchen appliances, elevators, and other everyday devices on the Sabbath. To justify their decisions, rabbis interrogated minute technical details of these objects. Sabbath prohibitions promoted innovation, as rabbis collaborated with Jewish engineers to create what they judged to be Sabbath-compliant adaptions of everyday technologies. Given that prominent rabbis often disagreed about proper technology use on the Sabbath, Jewish families had the opportunity to decide for themselves what counted as authentic devotion in handling personal and domestic technologies.

Religious communities and individuals often define their identity and seek to protect their values by embracing or rejecting what is seen to represent modernity. Amish people typically avoid owning automobiles, televisions, home phones, or Internet, but selectively employ solar-power, hay balers, power tools, and refrigeration. Those technological choices follow complex patterns; principles and practices regarding which machinery may be used under which circumstances vary across Amish and Mennonite geographic subgroups.¹

Modern Orthodox Judaism’s relationship to technology is structured along alternate lines. ‘Modern Orthodox’ Judaism seeks to unite traditional religious values with realities of twenty-first-century life. As discussed below, this represents a distinction from Ultra-Orthodox or haredi Judaism, whose communities often set themselves apart from the modern world. While Ultra-Orthodox Judaism issues blanket bans on some specific devices, for Modern Orthodox Jews the weekly calendar mediates when many technologies are permissible or temporarily forbidden. Many observant Jewish men, women, and children in the U.S., Israel, Europe, and elsewhere share mainstream technologized culture six days a week, using computers, cellphones,
cars, kitchen appliances, and other common machines, just as their non-observant counterparts do. Orthodox families switch to different rules for living on *Shabbat* (the Jewish Sabbath) ‘to keep it holy.’ Oakland Rabbi Judah Dardik declared in 2012 he was ‘completely addicted to my BlackBerry… 24/6,’ but committed to “once a week… discipline [where I]…. stop and tell myself, ‘Just let it go.’”

Although a tangled history of religious divergence makes labels such as ‘modern Orthodox’ historically imprecise, its nineteenth-century roots in Europe, particularly Germany, developed partly as a countervailing negotiation to the rise of more liberal religious experience in the evolution of what became known as Reform Judaism. During the later 1800s and early 1900s, many Jewish communities in Europe, the United States, and other countries wrestled with questions of whether and how to uphold fidelity to religious laws while updating observant practices. ‘Modernizing’ represented a means to project a more contemporary image, potentially more appealing both to fellow Jews and to outsiders. Both before and after World War II, key rabbinical leaders, synagogues, and educational institutions worked to foster a greater rapprochement between traditional Torah learning and secular knowledge, including modern science. Debates about the relationship between science and Jewish faith continued, especially given ethical challenges raised by twentieth and twenty-first century technoscientific developments. Could genetically-modified food win approval as kosher? What about lab-grown meat, particularly ‘test tube pork’? Jewish biomedical observers have argued whether stem-cell research, reproductive treatments, ventilators, and other health-care innovations violate codes governing the sanctity of life.

In Orthodox Judaism, the ideal of the Sabbath as a divine gift has also shaped attitudes toward technologies. Urbanization, industrialization, electrification, and mass communication all carried implications for families wanting to honor *Shabbat* rest, while not otherwise isolating
themselves from mainstream culture. As new inventions and networks reframed home life, jobs, and leisure, observant Jews debated whether the workings of such devices made them acceptable for Sabbath use or not. One day each week, practical decisions about how to move around, cook, read, even turning on lamps, all became scales of religious trust.

Commandments to lay ‘work’ aside once a week led rabbis, legal scholars, and Orthodox families into decades of argument over both religion (the meaning of Shabbat), and technology (details of its operation). Experts worked with sympathetic engineers and technicians to unpack fundamentals of how ordinary mechanisms functioned. Under Jewish laws, analysis required revisiting questions echoing those that children ask about devices - what actually is electricity? What happens when you flip a switch? How do elevators run? - which then opened the path for observant Jews to engage both the challenges and opportunities involved in coordinating faith with the technological pervasiveness of modern life.

Modern Orthodox Jews conscientiously protecting Shabbat did not reject modernization on principle. They passionately scrutinized it, building or challenging generations of opinion about whether specific machine-aided actions constituted forbidden ‘work.’ When the bulk of sentiment concluded that using particular items violated Sabbath commandments, Orthodox inventors and entrepreneurs engaged that tension. Restrictions fostered innovation, encouraging creation of alternate designs for mainstream products, tailored so every aspect accommodated observant sensitivities. Some religiously-targeted inventions, such as ‘Sabbath mode’ on mass-produced appliances, penetrated the general market. Choosing home equipment and personal goods, Jewish purchasers had to consider religious pronouncements for each option. To determine whether Orthodox principles permitted using specific devices on Shabbat, consumers consulted rabbis, read articles, talked with friends and relatives. Deciding to adopt, avoid, or adapt specific technologies, families embraced their own interpretations of modernization to
construct their Sabbath, the most essential ritual of Judaism. This article focuses on three cases, how modern Orthodox authorities and families drew and debated Shabbat technological borders around light switches, kitchen appliances, and elevators.

**Orthodox Sabbath observance and the concept of ‘work’**

By 2015, about 10% of all American Jews identified as Orthodox, 500,000-600,000 (though estimates sometimes run as high as 900,000). Another 850,000 Orthodox lived in Israel, with perhaps 750,000 distributed across London, Toronto, Montreal, Buenos Aires, Antwerp, and elsewhere. The umbrella term ‘Orthodox Judaism’ covers multiple distinctions, with important ramifications concerning technology usage. Ultra-Orthodox subgroups, known as the haredi, and Hasidic communities live largely self-segregated, set apart from outsiders by everyday habits, stringent beliefs, dress, language, and upbringing. Homogeneous enclaves have exercised community authority to ban Internet access, condemned as tempting evil and distracting from faith. In public ceremonies, influential rabbis have thrown tablets and iPhones into bonfires; ultra-Orthodox schools and communities have forbidden both students and adults from owning smartphones or using social media. To promote technological use that accommodated religiously-imposed limits, Israeli companies developed software that allowed email and selected online activities, while blocking functions and websites deemed objectionable. Rabbinical committees could grant permission to use such ‘kosher’ operating systems for believers who argued convincingly that their business responsibilities necessitated some connectivity. Studies and anecdotal reports suggest that thirty to forty percent of ultra-Orthodox maintain at least filtered online access, while unknown additional numbers connect without constraints, clandestinely.
In contrast to haredi and Hasidic insularity, ‘Modern Orthodox’ Jews generally live a cross-world co-existence, seeking to respect religious practices while engaging secular Western context. While Ultra-Orthodox authorities of the early twenty-first century blamed social media for divorce, child neglect, and obscenity, ‘Modern Orthodox’ Jews embraced technologized connections. The U.S.-based Orthodox Union engaged users via chat-messages, Twitter, Facebook, YouTube, LinkedIn, and Instagram. Apps to promote observance proliferated, offering digital prayerbooks and Torah readings, mobile guides to synagogues and kosher food, calendars to track prayer schedules, and a remote means to send prayers and notes to the Western Wall.

Six days of the week, Modern Orthodox believers blend in with the rest of society as they send texts, drive, and microwave dinner. Shabbat represents the occasion when habits of Modern Orthodox individuals diverge most visibly from people of other faiths (or none). Mainstream commentary sometimes portrays believers’ temporary abstention from ‘normal’ technology-centered life as antiquated eccentricity. In 2009, journalists marveled that to avoid Saturday driving, Senator Joe Lieberman planned to walk five miles from synagogue to the Capitol in bitter winter to cast a crucial vote. When Jacob Lew headed President Bill Clinton’s Office of Management and Budget (OMB), Lew’s Shabbat avoidance of telephones attracted notice. NBC News reported that one Saturday, Clinton asked Lew to take a call, allegedly declaring, ‘God would understand.’ Lew later declared this widely-repeated narrative incorrect, explaining that Clinton actually told him not to call and apologized for forgetting it was Saturday. In turn, Lew accommodated Washington’s workaholic politics and made a few Saturday calls on urgent matters, such as high-pressure budget negotiations.

For Lieberman and Lew, refraining from using cars and telephones on Shabbat reflected a directive to guard that day as free from work. Starting from Genesis 2: 3, ‘God blessed the
seventh day and He hallowed it,’ numerous Torah verses stressed that weekly Sabbath respites represented a mandate, delineating the essence of Jewish identity. Exodus declares, ‘Six days may you work…, but the seventh day is a Sabbath to the Lord…; you shall perform no labor, neither you, your son, your daughter, your [servants], your beast….’ Jeremiah 17:22 elaborates, ‘Neither shall you take a burden out of your houses on the Sabbath.’ Later verses re-emphasize the ‘everlasting covenant’ to obey a ‘Sabbath of complete rest, holy to the Lord,’ mandating death penalties for violators.11

Based on these texts and later interpretations, Shabbat came to represent the heart of Jewish faith. Sixteenth-century mystics personified Shabbat as a feminized divine who spread sheltering wings over the observant and gave them an extra soul for the holiday’s duration, to ensure spiritual elevation and the rule of peace. Accounts describe practitioners dressed in white walking into the fields at sunset on Fridays, to welcome ‘her’ visit and escort her toward the community and synagogue. Twenty-first-century Sabbath observance still centralizes metaphors rooted in such imagery; prayers and songs frequently refer to the Sabbath as a ‘queen’ or ‘bride.’ Like guests at weddings or coronations, Jewish people are expected to respect the privilege of ‘her’ presence by cleansing themselves physically and spiritually, preparing flowers and good food. Observant Jews celebrate Shabbat with special meals and family ceremonies at home, with prayer and community rituals in synagogue to combine joy, rest, and holiness.12

In capping each week’s routine by obeying the commandment of Sabbath rest, observant Jewish men and women aim to honor the dynamic of God’s original creation of the world, with its endpoint on the seventh day. In his influential 1951 book The Sabbath, Rabbi Abraham Joshua Heschel wrote, ‘It is a day on which we are called upon to share in what is eternal in time, to turn from the results of creation to the mystery of creation; from the world of creation to the creation of the world.’ Heschel, professor of Jewish ethics and mysticism at the Jewish
Theological Seminary of America, described *Shabbat* as ‘more than an interlude; it is a profound conscious harmony of man and the world.’ Shabbat also represented a ‘taste’ of ‘the world to come,’ an age when the broken world would be restored to perfect wholeness.\(^\text{13}\)

Traditional Jewish faith emphasizes the essential nature of *Shabbat* as a uniquely sanctified time. Saturday night ceremonies marking the end of *Shabbat* are called *Havdalah*, meaning ‘separation.’ Shabbat was meant to feel different, following a rhythm dissimilar to the other six days of productive labor. One prayer runs, ‘Blessed art thou, God, Who distinguishes holiness from the everyday.’ Heschel wrote, ‘Six days a week we wrestle with the world, wringing profit from the earth; on the Sabbath we especially care for the seed of eternity planted in the soul.’\(^\text{14}\)

To clarify the meaning of ‘complete rest,’ Jewish law enumerated thirty-nine types of transformative labor forbidden from Friday sundown to Saturday sunset: agriculture (plowing, reaping, etc.), domestic work (sewing, baking, grinding), writing and erasing, building or wrecking, lighting or extinguishing fires, and finishing a product.\(^\text{15}\) While banning such manual activities, law and tradition also called for families to celebrate *Shabbat* by wearing nice clothes, enjoying delicious meals, and visiting friends.\(^\text{16}\) Coining a resonant phrase, Heschel described the Sabbath as ‘a palace in time.’ He wrote, ‘Call the Sabbath a delight: a delight to the soul and a delight to the body… [C]omfort and pleasure are an integral part of the Sabbath observance.’\(^\text{17}\)

The principle of making Sabbath a sublime interlude posed inherent difficulties for observant homemakers. Although tradition called for celebrating *Shabbat* with festive meals, generous Friday dinners and Saturday lunches would not magically appear on days of rest. Like their counterparts across the United States and many other nations, well-off and middle-class Jewish families of the twenty-first century had grown accustomed to certain expectations of domestic comfort.\(^\text{18}\) On days other than *Shabbat*, eating a hot, filling main course, or enjoying
cold drinks freshly taken out of the refrigerator, represented conveniences easily taken for
granted. Sabbath observance temporarily complicated all such dining activity. Yet as with any
religious framework, translating Shabbat principles into practice opened multiple paths for
followers to embrace, reject, or adapt.

Such matters have generally escaped most academics’ notice. David Zvi Kalman has
traced some Judaism-related patents, such as early-twentieth century matzoh-making industrial
processes and electric memorial plaques. Communications scholar Heidi Campbell has
analyzed Orthodox approaches to computers, cellphones, and other contemporary media.
Anthropologist Alan Dundes interpreted Orthodox technology choices in Freudian terms, as
reflecting dual fixations on purity and argumentation, where joy in following rules was only
exceeded by the elation of cleverly skirting them.

In case studies exploring the agency of consumers, historians and sociologists of
technology have highlighted ways that gender, national organizations, international politics,
mediators, economics, fashion, symbolism, power dynamics, and many other factors affect the
‘consumption junction.’ The intersection of consumerism, technology, and religion appears in
subsets of the historical literature, as in Roger Horowitz’s account of the manufacturing and
marketing of kosher foods, or in historical, sociological, or media-studies accounts of religious
broadcasting on radio and television. Overall, however, there has been relatively little attention
to the significance of faith as a factor in modern consumerist technological choices. Historical
literature on invention does not usually include rabbis as key players or consider religious belief
as a driving force behind modern innovation.

Like technology itself and like other religions, Judaism has evolved over the centuries in
dialogue with different elements of culture, geographic changes, and human choices.
Urbanization, population movements, and socioeconomic shifts fostered the nineteenth-century
emergence of Modern Orthodoxy, Reform Judaism, and Conservative Judaism, followed by twentieth-century Reconstructionist Judaism, all seeking to remodel religious identity to fit more naturally within modernizing society. Post-World War II trends in the United States particularly seemed to favor the relaxing of strict Orthodox practices. American cities such as Silver Spring, Maryland; Riverdale, New York; and Brookline, Massachusetts attracted ‘a critical mass of Orthodox Jews committed simultaneously to strict Jewish tradition, and the suburban lifestyle,’ historian Jonathan Sarna has concluded. Those residents walked to synagogue on Shabbat, but embraced car-centered routines on other days, ‘a symbol of Orthodoxy’s ability simultaneously to resist and accommodate modernity’s blandishments.’ From the 1960s onward, the Jewish Renewal movement, Humanistic Judaism, and independent progressive institutions all aimed to construct a more informal framework for spirituality and connection, designed to attract Jewish young people in particular. All these philosophies defined different models for worship, choosing which traditions and laws to embrace and which to update or loosen, to maintain a comfortable balance between Jewish identity and the outside world. As Miri Freud-Kandel has commented, ‘[I]t could be argued that practical shifts in individual observance of Jewish law have driven the development of the religious movements as much as the reverse.’ That history in turn led haredi leaders and institutions to reassert their emphasis on strict observance of ritual. The ultra-Orthodox did not ignore modernization; indeed, its impact pushed leaders and institutions to guard their boundaries more meticulously.24

Jewish people, synagogues, and communities typically locate themselves (and others) on a religious continuum, from open, liberal, and relatively non-observant, gradations, toward extremely strict personal practice, as Sarah Bunin Benor writes. Yet over time, standards have been realigned. In recent years, Reform Judaism has shifted to re-embrace tradition, with greater use of Hebrew in prayers and with more rabbis and congregants choosing to cover their heads.
For advocates, that intensified emphasis on ritual offered a sense of personal fulfillment, deepening the authenticity and religious vitality of Reform practices. At the same time, Modern Orthodoxy has begun to bifurcate, some observers conclude. Moving closer to the ultra-Orthodox spectrum, some socially and politically right-leaning Modern Orthodox synagogues and institutions have deepened their strictness of observance, even as others reasserted their ‘modern’ nature, advocating wider roles for women and more openness on gender issues.25

Early twenty-first-century demographic patterns strengthened the foundation of haredi communities, characterized by large families and close ties. Even though most Ultra-Orthodox institutions do not actively seek new members from outside, a substantial number of adult men and women also join the community each year. Studies suggest that for those converts, a framework of observance offered a reassuring sense of ideological purpose and personal stability. The tradition of honoring Shabbat carried an especially compelling power of emotional integrity, a centuries-old tradition structuring weekly time to let individuals clear room for spiritual investment, physical rejuvenation, and a mental intermission. In a 2013 survey of Jewish Americans, 99% of Ultra-Orthodox respondents said they ‘always or usually’ performed the ritual of lighting Sabbath candles (as compared to 78% of Modern Orthodox respondents, 34% of Conservative Jews, and just 10% of Reform Jews).26

That same 2013 survey, however, also indicated a sizable variation in observance, even among the nominally strictest segments of the American Jewish population. Only 76% of Ultra-Orthodox Americans said they obeyed the precept to avoid handling money on the Sabbath. The report indicated that the share of Orthodox Jews who postponed financial matters over Shabbat reached 88% among those living in heavily Orthodox areas, in contrast to more geographically isolated individuals, a difference underlining the significance of community expectations, as well
as the possible limits of self-reported polling. A significant number of Modern Orthodox respondents, 81%, also claimed to refrain from using money over *Shabbat*.27

Thus, despite the fact that religious laws were meant to represent compulsory lines of behavior, at least some Ultra-Orthodox followed the norms of *Shabbat* somewhat selectively, as did Modern Orthodox Jews. Historian Jack Wertheimer argues that ‘across the spectrum of American Judaism the ethos of individualism and freedom of choice has spread’ in recent years, weakening formal leadership authority. Modern Orthodox in the U.S. display ‘a growing tendency to resist or ignore rabbinic decisors, or at least choose carefully whom to ask for an opinion.’ Especially given the ease of seeking alternative answers online, ‘growing numbers of congregants arrive at … their own understanding of what is proper.’ Though choices could invite criticism from family members or neighbors who adhered to different levels of stringency, this limited but real freedom of interpretation has proved significant for Modern Orthodox Jewish daily life, regarding technological questions such as the use of electricity, kitchen appliances, and elevators on *Shabbat*.28

**Debating the nature of electric light**

Many dimensions of pre-industrial boundaries between work and rest seemed obvious. Construction, farming, and woodchopping raised a sweat and exhausted muscles. Sewing, kindling a fire, and mincing vegetables required energy. Writing, drawing, or painting involved tangibly creating something new, which traditional Jewish law defined as work. But technological change complicated ideas of what constituted forbidden ‘work,’ even in something as seemingly straightforward as turning electric lights on or off. Starting in the late 1800s, Jewish authorities wrote numerous commentaries interpreting exactly what closing a circuit meant. At
least one confused rabbi thought that actual flames ran through wires. Even after clearing up that misunderstanding, rabbis observed that lights emitted heat and a glow, both problematically suggestive of output. Confronting unfamiliar technologies, observers sought to dissect their physical properties, to determine if any component violated Shabbat rules. Since ancient texts offered no commentary on light-bulbs, rabbis drew analogies to decisions from preceding centuries about which Sabbath activities were permitted or not.29

While Orthodox Judaism emphasizes careful adherence to religious precepts, that culture also has historically recognized and centralized disagreements as fundamental in Jewish philosophy. The foundational text of Jewish law, the Talmud, represents a collection of five-centuries-worth of rabbinical commentaries, interpretations, and deliberations. As legal scholar David Luban has noted, many arguments were recorded without resolution, making Talmudic ideas both challenging and inconclusive, open for ongoing discussion. For generations, Jewish scholars studied Talmud through rigorous disputation, based on a close parsing of documents, complex logic, and constructive reasoning. Religious-studies scholar Jacob Neusner describes the process of Talmudic debate as ‘a great many individual intellects in collision, like atoms, producing enormous heat but also energy and light.’ According to some communication scholars, the rhetorical patterns of traditional Talmudic debate between study-partners created ‘a cultural preference for disagreement.’30

Thus, it is perhaps not surprising to find intensive arguments among religious authorities about how to interpret the details of technological operations, in regard to Jewish laws governing the weekly respite from ‘work.’ Some Jewish leaders worried that turning on electric lights violated Shabbat bans on heating metal, likened to cooking. They disagreed, however, on defining the turning point. One argument held that the injunction took effect when metal became too hot to touch, but Israeli Rabbi Shlomo Zalman Auerbach, who commented extensively on
electricity from the 1930s into the 1980s, declared it was when metal started shining like red-hot coal. Other rabbis countered that in turning on bulbs, any heating of metal was an unintended consequence and therefore didn’t count as problematic. Still others argued that since filaments didn’t burn up, turning on bulbs didn’t transgress Shabbat bans on either cooking, lighting fires, or heating metal. Nineteenth-century rabbi Sholom Mordechai Schwadrom said that since electric light did not consume the filament, it compared to the Exodus burning bush and deserved looser rules, but few scholars concurred. Most also vetoed turning off lights, as equivalent to banned acts of extinguishing fires or finishing a job.\textsuperscript{31}

Considering the twentieth-century invention of fluorescents, neon lights, and LEDs, religious scholars generally agreed those different technologies did not contravene the bar on creating flame over Shabbat. However, most warned that turning on non-incandescent bulbs remained forbidden, since it transgressed the rule against creating something new.\textsuperscript{32} Completing a circuit meant bringing electric equipment ‘from death to life,’ Rabbi Avrohom Karelitz said, violating the ban on building. Karelitz, a Belarusian-born Israeli rabbi known as the ‘Chazon Ish,’ also cautioned that turning on lights could be considered making a useless thing useful, like winding a watch, forbidden on Shabbat. Countering that argument, Auerbach compared opening or closing a circuit to opening or closing a window, so easy that children did it, therefore fine on Shabbat. For Auerbach, turning lights on or off was too mundane to break the rule against completing an undertaking. Flipping lights was an impermanent act, more like shutting a door than building a wall, he argued. Early twentieth-century rabbi Yitzchak Schmelkes had linked a light-switch ban to established precedent that Jews should not add perfume to clothes over Shabbat. Auerbach rejected that analogy, since scent lingered in clothing, but lights instantly switched on or off.\textsuperscript{33}

Twentieth-century rabbis still argued about the basic nature of electricity, whether it
equated more to fire or water, with its ‘currents’ and ‘flow,’ but with talk about leaving lights ‘burning.’ Karelitz likened electricity to forbidden ‘embryonic’ flames, though others said turning on power was like opening a tap and letting cold water gush out, valid on Shabbat. Karelitz warned that turning on electricity might create sparks, but Auerbach dismissed sparks as religiously insignificant, being short-lived, unpredictable, and accidental. Nobel Prize-winning physicist Richard Feynman described his amazement in the 1950s at having rabbinical students repeatedly ask him if electricity was fire. Feynman lectured them, ‘Electricity is not fire. It’s not a chemical process, as fire is.’

Looking beyond the bulb, rabbis evaluated the Shabbat legality of the entire electric supply. Some cautioned that turning on lights might create forbidden work by raising fuel consumption, but others held that since power lines connected many buildings, residents turning lights on or off would all cancel out. Some feared that consumer electric-use might indirectly violate principle, by forcing power-plant staff to monitor and repair equipment. Since observant Jews did not take jobs over Shabbat anyway, Israeli utilities relied on less-strictly religious personnel for Friday/Saturday shifts. But Orthodox authorities considered it impermissible to create Shabbat tasks for anyone Jewish, even if those individuals chose not to obey days of rest. Rabbi Shlomo Goren pointed out that the issue might not arise on Friday evenings, when systems likely still ran on pre-sundown maintenance and fueling. Touring Israeli power-plants in 2009, a nine-rabbi committee noted that about eighty percent of functions had been automated, a trend that would render irrelevant any concerns about imposing Sabbath work on Jewish employees. But even if the Orthodox avoided using lights over Shabbat, leading rabbis agreed that the Israeli state was obligated to keep producing power, to prevent accidents, ensure public safety, and meet medical needs. Their reasoning followed pikuach nefesh, the tenet that in order to save a life, Jews should be ready (indeed, required) to take otherwise-forbidden actions.
Following all these debates, consensus came to ban flipping switches on *Shabbat*, honoring commandments to make the day special. As one commentator explained, ‘If turning electrical currents on and off would be allowed,… since almost anything can be accomplished today using electricity… there would no longer be any apparent difference between *Shabbat* and the other days of the week.’ Observant Jews typically turned on whichever lights they wanted before Friday sunset, leaving them on through Saturday. But mistakes happened; children too young to comprehend *Shabbat* might use lights unknowingly. Adults could carelessly lean against wall switches, or forget the day and flip lights by habit. If people accidentally turned lights on or off over *Shabbat*, reversing the preferred state, errors could not be corrected. Families would have to fumble through dark kitchens or try to sleep in brilliantly-lit bedrooms. Some improvised by draping blankets or towels over lamps for slumber, a serious fire hazard.

To minimize risks of unintentionally violating rules, some Orthodox families taped down light switches over *Shabbat*. Twentieth-century inventors created many devices to temporarily block normal switch activation. Some patents explicitly linked such designs to Sabbath obedience, while others cited broader advantages, including conserving energy and avoiding disaster if crucial factory or hospital machines were turned on or off unexpectedly.

Taking a different approach, Canadian rabbi Shmuel Veffer in 2005 patented the ‘KosherLamp.’ Users turned on the bulb before *Shabbat*, then rotated a cylinder around it, to illuminate or shadow a room. Veffer said that as a rabbi, he ‘trained as a problem-solver,’ and wanted to help Jews relax, read, or sleep on *Shabbat*, without worrying about light-switch complications. Veffer believed his lamp’s design, operating with unique motions, heightened appreciation of Sabbath distinctiveness. ‘Every time I twist the KosherLamp shade,… [I] think about God in a way that I wouldn’t during the week when flicking the switch on and off.’

While Orthodox Jews represented a small market, they had access to innovations
intended for all consumers. Electric timers, advanced ‘smart-home’ automation, and programmable coffeemakers all promised to make Sabbath easier and more pleasant. But religious authorities argued over the legitimacy of time-manipulation technologies. Debates partly turned on precedent; some early rabbis had approved of adding wheat, before Friday sunset, to water-powered mills that operated unattended through Saturday. Some modern rabbis cited that ruling to justify pre-setting VCRs and DVDs to record programs over Shabbat, as long as televisions’ soundtrack and picture remained off. Others disapproved of using timers, arguing that programming instruments to do otherwise-unpermitted acts on Shabbat was just as improper as asking non-Jews to handle a chore on Jewish people’s behalf. That comparison left wiggle room, given the history of Jews hiring ‘Sabbath goys’ to come to their homes or synagogue to kindle fires and perform other tasks. Mario Cuomo and Colin Powell remembered helping New York Jewish neighbors over Shabbat as children, as did Elvis Presley while living near a Memphis rabbi. Strict interpretations banned observant Jews from requesting someone turn on electric lights, but some saw ambiguities that permitted dropping hints.

Out of practicality, using preset ‘Sabbath clocks’ to run lights, air-conditioners, baby-monitors, and more became convention in many late-twentieth-century observant communities. Authorities disputed whether it was legitimate to reset timers on Shabbat, to adjust the beginning or end. Some rabbis let users turn a dial to alter settings, but considered it impermissible if changes entailed moving a peg. In 2014, New Jersey’s ZMAN Technologies introduced the ‘Next-Generation Shabbos Timer,’ describing it as ‘redefining the interface of Shabbos observance and technology in a manner that promotes utmost adherence to the sanctity and splendor of the holy and uplifting day of rest.’ The UL-certified ZMAN switch let families select desired lighting patterns in all rooms for every upcoming Sabbath. It integrated the programming with a Hebrew-date calendar, adjusting on-off settings to account for geographic location,
daylight-savings time, and Jewish holidays. Once internal clocks calculated that Friday sunset had passed, the device automatically entered Shabbat mode, which disconnected regular light-switch operations (with overrides for health and safety). The firm claimed to have secured multiple rabbis’ testimony that ‘the ZMAN Switch meets the highest standards of avoiding tampering with electricity on Shabbos.’ The company contended that its product improved Jewish life, by eliminating recrimination and guilt when someone accidentally flipped lights.\footnote{47}

Even high-tech timers, however, could be annoyingly complex, awkward, or unreliable. In 2011, inventors patented an item that claimed to reconcile electrical activation with Shabbat, by altering the thing that had so impressed nineteenth-century observers, electricity’s immediate response to the flick of a finger. Touching the new ‘KosherSwitch’ swiveled aside a piece of plastic; the mechanism then (after a random pause) sent light pulses at random intervals on cycles that randomly failed, until finally hitting the right sequence to activate lights, up to two minutes later. With built-in ‘uncertainty, randomness, and delays,’ designers said, ‘your action isn’t causing anything to happen, but only allowing something to maybe happen in an unrelated future,’ therefore not performing any illegal Sabbath work. The device made Shabbat obedience ‘more attainable and appealing,’ backers maintained, and prevented sinful wastefulness, since Jewish homes and institutions would no longer keep lights on for twenty-four hours. \footnote{48}

In 2015, an Indiegogo campaign to move the KosherSwitch from beta-testing to production raised its $50,000 goal in four days. Testimonials claimed that thirty rabbis had approved the KosherSwitch. ‘Many Torah giants… have analyzed, endorsed, and/or blessed our technology and endeavors. Some have even provided crucial guidance on key design elements!’\footnote{49} Furious dispute erupted. Critics accused the company of concealing rabbinical caveats that KosherSwitch should only be used on Shabbat to preserve health and safety, following pikuach nefesh. Rabbi Yehoshua Neuwirth and others denied that they had validated
the KosherSwitch. Inventor Menashe Kalati accused ‘zealous individuals of hav[ing] coerced’ those rabbis to ‘backpedal.’ Kalati asserted that Neuwirth had visited his firm twice and ‘spent… hours with us going through the device. He really got the full experience and then to go and claim that he didn’t know who we were and what it was for is really quite unimpressive.’ Kalati noted pointedly, ‘That this mysteriously came up is extremely suspicious, especially from a company in competition with us.’ Indeed, KosherSwitch critics included rabbis connected to ZMAN Technologies and another institution, the Zomet Institute.\textsuperscript{50}

Questions about legitimacy centered on different interpretations of both Sabbath law and KosherSwitch’s mechanism. Kalati justified the KosherSwitch by saying that users just moved a tiny flap, doing nothing like ‘work.’ Disapproving rabbis warned that activating a KosherSwitch seemed too akin to flipping regular switches, failing to separate Shabbat from everyday routine.\textsuperscript{51} Kalati replied that handling KosherSwitch felt very different, since in ‘Sabbath mode,’ users had to pause and look for a green-light, signaling that the system was clear. Other debate revolved around the meaning of randomness. Rabbi Dovid Schochet scolded, ‘Although they claim… (the operation) is random, in reality the fact is that within a short while, there is a sure connection of an electric circuit.’ Rabbi Shmuel Kopel added, ‘[F]lipping the switch is clearly intended to cause the light to turn on…. if not, what is the purpose of it?’ Brooklyn Rabbi Yisroel Belsky scornfully compared KosherSwitch to a Rube Goldberg contraption.\textsuperscript{52} Debates revolved around Jewish legal concepts of ‘indirect action.’ A key analogy assessed whether it was wrong to open a window on Shabbat if resulting drafts extinguished a candle. Answers partly turned on whether a wind was already blowing, and whether the window was opened in order to blow out the flame or if that was unintended consequence.\textsuperscript{53}

KosherSwitch’s invention reflected a history of religiously-conscious innovators seeking technical maneuvers to reconcile modernity (in terms of ubiquitous domestic and everyday
conveniences) and conscience (in terms of Sabbath observance). Sabbath-related inventions were always defined primarily by their religious meaning, as were the Orthodox-serving businesses that promoted them. Jerusalem’s Institute for Science and Halacha (Jewish law), founded in 1965, partnered scholars with engineers, to evaluate how to modify mainstream devices for legitimate Shabbat use. In 1983, Institute-affiliated Rabbi Levi Yitzhak Halperin patented an ‘indirectly activatable’ telephone that constantly sent light pulses to dial but also simultaneously disrupted them. After sundown Friday, users inserted a pen or stick to block that blocker, indirectly establishing a connection to make calls. The Institute defended its creations as using ‘intentional loopholes’ that God deliberately left open for human creativity. Director Dan Marans said, ‘[W]e see God as an all-knowing being, who knew we’d eventually have cellphones and digital cameras. We believe God knew within the framework of Jewish law that we could solve these problems.’ The Institute created or endorsed supposedly-Sabbath-compliant burglar alarms, coffeemakers, and other products for the observant market.

Such inventions proved too radical for some observers, too half-hearted for others. Rabbi Yisrael Rozen, a former Institute staffer and engineer, complained Halperin still ‘didn’t want to touch a lot of things.’ In the 1990s, Rozen opened the Zomet Institute to pursue what he called ‘techno-halacha,’ innovations conforming to religious law. Orthodox engineers and rabbis teamed up to alter electric wheelchairs, stair lifts, and scooters for Shabbat use. Many Zomet inventions relied on legal concepts of grama, indirect action, inserting delays or extra steps between action and response. Old rulings on grama instructed Jews not to fight minor housefires directly on Shabbat, but to extinguish flames by surrounding them with water jugs that would burst in heat. Zomet engineers adapted electric wheelchairs’ main switch, brakes, and other mechanisms to fit rabbis’ verdict that while building something new on Shabbat was forbidden, it was permissible to make modifications. Zomet wheelchairs remained powered up over
Shabbat, at low levels where frictional forces kept them stationary. To move, users raised the current to increase wheel speed, which Zomet deemed a legitimate adjustment. While rabbis disagreed fervently over interpreting complex principles of indirect action, some praised Zomet mobility aids as a blessing, enabling physically-impaired Jewish people to maintain independence on Shabbat and to attend synagogue and family gatherings.60

Zomet used its ‘electronic grama’ switch to build arguably-Sabbath-compliant vehicles, computers, baby-monitors, water-heaters, a ‘grama phone,’ and more.61 Technicians designed complex automation for Israeli dairy farms, where cows’ presence automatically started and stopped washing equipment, milking, and pumps.62 Zomet made pens to let doctors, judges, and police take crucial notes or write prescriptions on Shabbat, with ink that disappeared after seventy-two hours (to be photocopied first). Zomet emphasized such technologies were for emergencies, that only medical or security personnel should break bans on writing, phoning, and driving over Shabbat.63 Even using its specially-designed computer, Zomet recommended, typists should press keys with a thimble or stick, to make Shabbat distinctive by performing ordinary activities in unusual fashion.64 Israeli Defense Forces reportedly acquired Zomet-designed telephones and computers, as did the prime minister’s office, reflecting the complex realities of governing in a nation with strong religious constituencies.65

Even as Zomet crafted devices to avoid violating Shabbat, at least by its rabbis’ interpretation, observant users often made choices according to emotion and custom, rather than technical logic. Early twentieth-century rabbis warned against using microphones on Shabbat, lest it create forbidden sparks, heat metal parts, or raise electric current. In 2012, Zomet invented a new form of microphone it claimed as Sabbath-compliant. But for many Orthodox synagogues, amplification at religious services still didn’t feel right. Decisions about technological use revolved not just around what we might easily categorize as technical claims, but also around
users’ values for Shabbat as sacred. Tracing the shifting boundaries between these bases for decision-making reflect the continually-evolving definitions of both religion and materiality.66

**Evaluating and adapting home appliances for Orthodox use**

Beyond barring use of electric switches, Shabbat interpretations of ‘rest’ made other ordinary household items inaccessible to Orthodox Jews. Turning on hot-water became taboo, since boilers refilled with cold water, and heating it equated to cooking. Instant-hot-water taps, tankless water-heaters, and electronic-ignition heaters all violated rules of one kind or another. Authorities differed over permissibility of solar-heated water, depending on the system’s exact design and on centuries-old arguments whether cooking food in sun-baked sand or hot springs was legitimate on Shabbat.67 Avoiding any hot-water use on Shabbat required people to be cautious, especially with one-handled faucets that might accidentally draw some hot water unless users remembered to fully swivel the handle before raising it. Complicating the situation, some designs always ran a bit of hot water even when the lever was pushed over completely; other handles pivoted in a circle, making it difficult to ensure getting only cold water. Rabbis advised Jewish homes to choose two-handled faucets or shut off each sink’s hot-water valve before Shabbat.68

Again, observant entrepreneurs seized the opening to craft religion-compliant devices. In 2006, after his wife complained that cold water left her hands raw, plumber Nissim Issacson invented a controller offering more precise programming than manufacturers’ default water-heater temperature of 140 degrees. In Sabbath-mode, Isaacsom’s ShabbHOT kept water just below 113 degrees, which many authorities defined as yad soledes bo, scalding point.69 Multiple rabbis reportedly certified his setting as legitimating Sabbath hot-water use for cleaning dishes,
babies, and hands. In his 2006 patent application and promotional literature, Isaacson claimed that in addition to being Sabbath-compliant, his system protected users from dangerous burns, extended heaters’ lifespan, and saved over one hundred dollars annually on energy bills.\textsuperscript{70}

Beyond limitations on water use, Orthodox families faced other practical challenges in \textit{Shabbat} kitchens. Celebrating the weekly holiday with hot meals was traditionally considered a blessing, but lighting stoves or ovens was off-limits. Generations of observant families in Europe, the U.S. and elsewhere, under widely varying living conditions, had to select how to adapt their domestic habits to that constraint, even as newly-introduced kitchen technologies repeatedly raised new religious considerations. For example, Raytheon began selling microwave ovens for the home market in 1955. By 1997, an estimated ninety percent of American households owned affordable, compact microwaves, making quick cooking and simple re-heating into standard kitchen repertoire. In a 2006 survey, 68 percent of Americans defined microwaves as something they could not live without, ranking them behind only cars, clothes washers and dryers, and air conditioning as essentials.\textsuperscript{71} But observant Jewish families knew that using microwave ovens generated lights and sounds, heated wires inside the magnetron, and activated features such as browning elements, all forbidden on \textit{Shabbat}. Also, since food absorbed microwaves unevenly, people intending just to warm up pre-made food might end up illegitimately cooking portions on the Sabbath.\textsuperscript{72}

As a work-around for Sabbath meals, some households used a \textit{blech}, thin metal sheets placed over gas or electric burners turned on low before sundown Friday. Most authorities agreed that a \textit{blech} could legitimately warm pre-cooked food, though with many caveats. Users had to add spices and liquids before \textit{Shabbat} and take pans off the \textit{blech} before serving. Conditions for replacing pots once removed from a \textit{blech} grew further complex, and guidelines varied between Ashkenazic and Sephardic communities.\textsuperscript{73} Late twentieth-century rabbis did
often approve use of warming drawers and hotplates, providing the devices weren’t hot enough to actually cook food.\textsuperscript{74}

Even on low heat, stoves and hotplates posed risk. A \textit{blech} might inflict serious burns, especially hazardous to children. To keep meals warm, some families covered hotplates or stoves with blankets, easily ignited. Others used electric griddles as round-the-clock warming trays or jury-rigged other improvisations not covered in standard safety-tests. In 2011, a gas stove left on over a thirty-six-hour Jewish holiday hospitalized thirteen in New Jersey with carbon monoxide poisoning.\textsuperscript{75} Seven Orthodox children died in Brooklyn when a malfunctioning hotplate sparked fire in 2015; a similar blaze killed a boy five years before.\textsuperscript{76} New York-area Orthodox rushed to hardware stores to pick up new smoke detectors, staged family fire-drills, inspected hotplates and sometimes chose to connect hotplates to timers rather than leaving them overnight. In that way, individual families’ religiously-driven choices about \textit{Shabbat} meals raised serious ramifications not just for their own safety, but for public concerns about community well-being.\textsuperscript{77}

As with electric lights, restrictions on Sabbath use of regular kitchen equipment spurred innovators to think up alternatives. By the 1920s and 1930s, with the spread of home electrification, American manufacturers had begun to offer consumers a bewildering array of new toasters, grills, hotplates, percolators, blenders, mixers, egg cookers, waffle irons, chafing dishes, popcorn and hot dog makers, baby-bottle warmers, and other specialized products.\textsuperscript{78} Using that abundance of small electric appliances generally remained forbidden on \textit{Shabbat}, but one pre-World War II invention offered unique religious compatability. In 1940, Irving Naxon patented a portable electric roaster, designed for slow, even cooking over low heat.\textsuperscript{79} Naxon was inspired by his Lithuanian grandmother’s stew, left in a bakery’s large oven as it shut down on Friday, then retrieved on Saturday. Eastern European Jews commonly used that technique of simmering in an oven’s lingering heat to make \textit{cholent}, a bean, meat, and vegetable meal.\textsuperscript{80}
Naxon’s CrockPot became a late-twentieth-century kitchen staple, popular with non-Jewish consumers who had never heard of cholent. For Orthodox families, slow-cookers often met religious guidelines, since they didn’t require stirring (forbidden on Shabbat), though complex debate arose over the precise rules to legitimate their use. Again, concerned parties scrutinized the details of crockpot design, such as the arrangement of controls and heating elements. Orthodox families could be disproportionately valuable as miche-market consumers, since the strict requirements of keeping kosher led many to buy duplicate appliances. Since meat and dairy products could not be prepared with the same equipment, a family might own one crockpot for dairy products, a second for meat, perhaps a third for pareve food (neither meat nor dairy), or even a fourth to accommodate extra-stringent food rules mandated for the Passover holiday.  

While Orthodox Jews represented a tiny percentage of global population, they comprised valuable market shares in Israel and certain cities in the US and Europe. As computerization allowed engineers to build complexity into appliances, it became smart business for manufacturers to add elements appealing to even small subsets of consumers. In 1998, Whirlpool patented an oven ‘capable of… compliance with the Orthodox… requirement that no work shall be done on the Sabbath.’ Programming for ‘Sabbath mode' overrode the usual twelve-hour safety shutoff, letting users set ovens before Friday evening, then leave them on as long as three days.  

Adapting oven design for longer heating cycles was necessary, but not sufficient to satisfy religious considerations. Over preceding years, companies competing to draw consumers and raise pricepoints had added high-end features, which progressively made equipment ever more incompatible with Shabbat. If use triggered buzzers, lit up panels, or made the appliance respond in any way, strict interpretations forbade that as causing work. Accordingly, placing ovens in Sabbath-mode also required temporarily deactivating all digital indicators, timers, and inside lights. Engineers inserted a door-switch delay, so opening ovens to remove food didn’t
instantly alter heat levels. In inventing Sabbath-mode, Whirlpool had to un-invent all the bells and whistles (literally) that makers usually touted. To familiarize staff with relevant religious law, Whirlpool collaborated with Star-K, a Baltimore Jewish organization. Star-K’s Orthodox engineer Jonah Ottensoser said, ‘[W]e’re using software to make modern appliances like they were 20 years ago.’ Ottensoser advised observant consumers shopping for ovens to remember, ‘Simpler is better.’ Whirlpool’s new option occasionally confused non-Orthodox customers who mistakenly set appliances in Sabbath-mode and needed assistance canceling that. Despite such complications, Maytag, KitchenAid, and all other major manufacturers joined Whirlpool in making Sabbath-mode options available on ovens and other appliances by the early 2000s.

Sabbath-mode cleared away long-standing issues for Orthodox consumers facing refrigerators with digital temperature displays, automatic icemakers, open-door alarms, built-in fans, and similar elaborate features, all forbidden on Shabbat. Just opening a standard refrigerator on Shabbat risked turning on compressors, fans, and interior lights, all constituting ‘work.’ Accidentally opening the fridge on Shabbat required users to leave the door ajar until Saturday night, since closing it would compound the violation by turning off the light. To avoid such problems, some households taped down the door-opening switch or unscrewed fridge bulbs each Friday afternoon. Sabbath-mode programming solved those problems by delaying compressor activation and temporarily de-activating sounds, lights, water dispensers, and icemakers. Engineers also had to adjust internal operations, such as the way many models timed automatic defrosting, since keeping count of door-opening/closing motions violated Shabbat. Sabbath-compliant refrigerators returned to an older approach, defrosting at pre-scheduled intervals.

Appliances continued to present Orthodox consumers with compliance dilemmas. Even in Sabbath-mode, opening the door on some late-model ovens shut off electric elements or gas-
flow in a few seconds, to conserve energy. Just checking on cooking thereby amounted to turning an oven off, then on again, breaking Shabbat. Proliferation of new features even created violations when equipment wasn’t running. Some families cleared kitchen counters over Shabbat by storing dirty silverware, pots and plates in dishwashers. But even if they waited to start the cycle until Saturday sundown, simply opening the door on some models created ‘work,’ by activating digital readouts. Thus, conscientious Jewish households had to keep paying attention to minute details of how the latest appliances worked. It was no longer sufficient to postpone operating a dishwasher until after the Sabbath, if fancy displays turned on automatically.

As always through history, affluence facilitated access to new technologies, while poverty narrowed options. Some observant Jews renovated their kitchens specifically to incorporate new appliances and add Shabbat-friendly devices, such as warming drawers. Keeping kosher required extra cabinets to keep utensils, plates, silverware, and table linens used for dairy products separate from duplicate items used for meat. The ideal kitchen for kosher cooking contained two sinks to separate meat from dairy dishes, separate meat/dairy cooktops, a second dishwasher, a double oven, and extra counter-space. Custom remodeling and multiple purchases did not come cheap, but in the U.S., Modern Orthodox families had relatively high rates of college graduation, and more of them than in any other Jewish denomination had advantages of a good income. Those who could not afford such elaborate domestic arrangements could still keep kosher, through extra attention to complex rules. For instance, preparing a non-self-cleaning oven, electric mixer, or most kitchen equipment to satisfy the special koshering demands of Passover mandated additional time-consuming steps, sometimes involving partial disassembly, followed by meticulous cleaning with boiling water or even a blowtorch.
Religious implications of elevators, public space, and mobility

In addition to influencing appliance design and Orthodox families’ behavior and technological choices, religious concerns remade public spaces and infrastructure. Under rules that banned observant Jews from carrying things outside on Shabbat, people going to synagogue or visiting family could not bring prayerbooks, jackets, or even front-door keys. As a solution, many Orthodox neighborhoods created an eruv, a street area demarcated as symbolic extensions of the home. Inside that ritual domain, families could push baby strollers and wheelchairs, take meals or flowers to friends, and carry small items such as reading glasses. Communities created an eruv by attaching nylon cord, fishing line, wires, small pieces of wood, or plastic strips to telephone or light poles, incorporating existing walls, fences, or rivers. Though the low-tech result might not resemble a discernable enclosure, Jewish rulings equated it to a wall with multiple doorways. Authorities regularly checked to ensure a boundary remained intact. Los Angeles rabbis used helicopters to inspect remote mountain stretches, then reported eruv status to congregants via Twitter. By 2010, over 130 American locales had an eruv.88

Technological considerations also affected street engineering in Orthodox areas. Observant Jews walked rather than drove on Shabbat, but some considered it impermissible to press crosswalk buttons. Accordingly, Los Angeles set some lights near synagogues to cycle automatically over Shabbat. Those setups inefficiently forced all drivers to stop at red lights, even with no foot-traffic around. Engineers proposed installing radar that would only change traffic signals in the presence of waiting pedestrians, but some rabbis warned that it would break the Sabbath for Jews to trigger such automated systems.90
Crosswalk radar highlighted the religious issues created by twenty-first-century technologies that defied individual control. Walking to synagogue, home, hotels, or hospitals, people might unavoidably set off motion-detectors, floodlights, or surveillance systems. To assess whether observant Jews broke *Shabbat* by being captured on security footage, authorities debated whether light pixels equated to creating a written image, which might depend on whether videos were saved and whether monitors rotated through different feeds. Rabbi Shmuel Wosner ruled that observant Jews could be forgiven for triggering lights or cameras, providing they never intended to turn them on by walking past. Rabbi Nachum Rabinovich declared, ‘Essentially, the person does not act on the sensor, but the sensor acts on the person.’ He cited religious-law precedent which did not blame Jews for killing an insect on *Shabbat* if they accidentally trod on it in passing, though others judged that analogy irrelevant. Going further, Rabbi Elyashiv Knohl said that since sensors operated by indirect action, Jews on *Shabbat* were allowed to open automatic doors on purpose to avoid being stuck outside, but few concurred.91

More complications ensued when hotels, hospitals, schools, and other buildings installed motion-sensor-based toilets, sinks, and soap dispensers. Some rabbis declared that Jews could preserve personal dignity by using automatically-activated restrooms on *Shabbat* when necessary, but recommended they cover electric-eyes to prevent flushing.92 ‘Smart’ water meters also seemed to break Sabbath rules, by continually recording consumption and transmitting that information to central servers.93 Ultra-Orthodox authorities warned that in communities installing such automated systems, observant Jews might find it impossible to use any bathrooms on *Shabbat*. Accordingly, Israeli companies Arad Technologies and MTR Wireless Communications developed ‘*glatt* [extra-kosher]’ water meters that darkened screen displays over *Shabbat* or used old-style analog dials. Those models also paused data-uploads until Saturday sundown and measured water-use indirectly, through changes in magnetic field.94
Accommodating religious sensibilities could foster tension in shared spaces, as illustrated by the case of public elevators. Bans on ‘work’ prevented observant Jews from pressing floor or call buttons after Friday sunset, especially if indicators lit up. But that principle left a loophole; while believers could not ask others to perform a task for them, even as minute as pushing a button, they could capitalize on actions that non-Jewish people initiated for their own benefit. Whenever others summoned an elevator on *Shabbat*, Orthodox ‘piggybackers’ could follow them on, riding to the pre-selected level (hopefully just one or two flights of stairs away from their destination). In elite residential or business buildings, doormen familiar with Orthodox tenants might push the desired floor button without being asked. Strict interpretations might forbid Jewish people from accepting that favor, or at least require them to voice a protest, since the doorman had no wish to take the elevator himself.

But as with kitchen appliances, elevator technology violated the Sabbath ban on work in many ways beyond the door indicators. Older elevators might require passengers to hand-close an inner or outer grille. Newer models contained sensors to detect that doors had been shut, and some Orthodox considered it improper to trigger that photoelectric eye on *Shabbat*. Modern elevators might log trips automatically or record activity with security cameras.

Rabbinical debates engaged deep details of elevator engineering. In the 1960s, Israeli Rabbi Yitzchak Weisz argued that in designs where car and counterweight were precisely balanced, the act of ascending created forbidden work, since riders’ weight forced motors to consume more current, which might impose demands on utility employees. Other authorities countered that since an elevator cab was stationary when riders entered, any increased power use only came later, a legitimate indirect consequence. They added that since the circuit had already been established, merely raising the current should not count as ‘building’ or ‘completing’ something or igniting a fire. Dismissing power-station concerns, they added that given cities’
scale, any electric-grid impact from using a single elevator would effectively be zero.\textsuperscript{96}

While Weisz said that taking elevators up went against \textit{Shabbat} rules, Rabbi Halperin (of Jerusalem’s Institute for Science and Halacha) suggested in 1984 that ascending was fine, but descending should be forbidden. After seventeen years studying elevator mechanisms through contacts at Westinghouse and Otis, Halperin warned that designs that used passengers’ weight to activate regenerative braking might violate the Sabbath.\textsuperscript{97} Commentators plunged into analyzing precisely how elevator braking worked and related factors, such as elevator system size. Halperin’s critics suggested that any extra power sent into the system would be minimal and therefore religiously meaningless, especially since people took elevators in order to move, not to create electricity.\textsuperscript{98} Auerbach added that people should not be held religiously responsible for just standing inside a moving elevator, since riders could not know how their weight affected operations. Others responded that even if passengers didn’t think about braking when taking elevators, their desire for safety led manufacturers to install special systems that Jews should not activate, even indirectly, on \textit{Shabbat}. Each side cited precedent; some authorities pointed out that respected nineteenth-century rabbis had taken steamship journeys on \textit{Shabbat}, regardless of whether their travel raised fuel consumption.\textsuperscript{99} Extending debate over religious accountability for passive action, some cited a gruesome hypothetical in which a man who was pushed onto a stroller, crushing the baby, would not be condemned for murder, since mere existence of his weight did not represent an action.\textsuperscript{100}

While rabbis disputed abstract analogies and details of elevator engineering, Orthodox Jews living or working in tall buildings had to decide each Friday and Saturday if they should take elevators up, down, or not at all. Hardy individuals might climb stairs instead, but hospital patients, the aged, pregnant women, and parents toting infants could not take many flights.
Critics and families worried that elderly men and women in top-floor apartments might become isolated and depressed, if they could not get to synagogue or celebrate Shabbat with friends.

The late twentieth-century brought numerous patents for ‘Sabbath elevators,’ which could be set to stop automatically at each level, eliminating any need to press call or floor buttons. Elevators functioning in Sabbath-mode also disconnected photoelectric eyes, so as not to violate Shabbat by registering passengers’ presence and forcing doors to re-open. In 1978, Halperin patented an elevator that separated power requirements from load weights, with brakes that dissipated excess energy, rather than returning it to the system. For use in Jewish hospitals, Halperin’s design incorporated Sabbath-compliant switches that operated indirectly, holding doors open longer for maneuvering patients in and out. Institutional rivalry came into play; Halperin’s Institute for Science and Halacha and the Zomet Institute endorsed different types of Sabbath elevator as best for resolving conflicts between technology and religious observance.

While people living in many areas of the world might never encounter them, Sabbath elevators found natural markets in areas with a large observant population. In 2001, Israel’s legislature, the Knesset, mandated that in public structures containing multiple elevators, at least one must be Shabbat-compliant. By 2012, about seventy thousand Israeli buildings installed Sabbath elevators, as did many European and U.S. apartments, hotels, hospitals, and nursing homes serving Orthodox clients. But in 2009, four senior Israeli rabbis, led by the influential Yosef Shalom Elyashiv, upended the issue by warning that even specially-designed elevators broke Shabbat. Consulting ‘certified technicians and engineers’ about anti-overload detectors, the panel worried that riders’ presence caused elevators to gauge their weight and adjust consumption of current going both up and down, thereby ‘direct activation is created regarding doing work.’ Some protested that people had no easy way to find out if any elevator contained such detectors. Accusations flew; Halperin charged that amateur engineers ignorant of technical
details had pressured Elyashiv to issue the anti-elevator verdict. Other rabbis urged Elyashiv to modify his ruling to reassure the ill, elderly, or pregnant women that *pikuach nefesh* always excused them from climbing stairs.\(^{104}\)

Building managers’ decisions to install Sabbath elevators sometimes led to disputes between Orthodox and non-observant residents, who resented waiting while lifts inconveniently crawled between every level. One Manhattan tower set elevators to travel straight from the lobby to the penthouse, then downward floor-by-floor. ‘This arrangement gives the shortest ride up to those… who would have the toughest trek on the stairs,’ the *New York Times* pointed out, and also underlined real-estate class-divides by ‘giv[ing] the speediest trip to those who have paid the most.’\(^{105}\) Since delays infuriated observant tenants too, Israeli inventor-entrepreneur Shlomo Friedman created a Sabbath-elevator tracking device in 2012. He proposed installing screens in every apartment or hotel room, so people could wait comfortably while monitoring elevator arrival, rather than impatiently hanging around the hallway\(^{106}\) Other inventors patented schedule interfaces that let users program reservations for elevator trips directly to their floor at specific times over *Shabbat*.\(^{107}\) By 2013, about two dozen buildings in Israel installed touch-screen ‘smart elevators’ that offered such user-customized features.\(^{108}\) But pending innovations posed new questions; the manufacturer Escalade announced plans to incorporate fingerprint-readers or apps that would ‘automatically take passengers to their destination using voice activation and face recognition,’ designs some Orthodox might consider unacceptable for *Shabbat*.\(^{109}\)

**Religion, Technology, Work, and Rest in the Twenty-First Century**

Inquiries into technology and *Shabbat* observance stretched over centuries, evolving in parallel with new device and systems themselves, subjects of continual religious reassessment.
While late-nineteenth and twentieth-century rabbis evaluated Sabbath use of electricity, twenty-first-century leaders debated the *Shabbat* legitimacy of online transactions, texting, key-cards, and more. E-readers threatened to undermine the long-valued pleasure of Sabbath reading, since pushing buttons, touching screens to flip pages, and tracking reading locations all counted as ‘work.’ E-reader design seemed inherently improper to some, since each refreshing of the screen generated new text lines that broke rules against Sabbath writing or transforming material. Others countered that since pauses made displays go dark, any writing was unstable, therefore acceptable.110

Jewish constraints on technology use spurred creativity, as entrepreneurs invented supposedly-Sabbath-compliant lamps, electric switches, ovens, refrigerators, telephones, wheelchairs, and many other devices. Those innovations fostered additional dispute, as rabbis examined each mechanism in detail and dove into complex analogies drawing on centuries of religious-law precedent. Rabbis even debated prototypes, such as ‘self-driving’ vehicles that Google and other firms had begun road-testing. Observers asked whether Jews could legitimately ride on *Shabbat* in autonomous vehicles that navigated by sensors and software, without direct driver involvement. Reflecting on experiments in developing cars that could react to brains’ electromagnetic activity, Rabbi Dror Fixler, engineering lecturer at Bar Ilan University, asked if driving by merely thinking about it would violate *Shabbat*.111 Yet even if autonomous or mind-controlled cars required no ‘work’ by a driver, others noted, such transport might still contravene rules against traveling long-distances on the Sabbath, starting something new, and lighting fires, as well as flouting the spirit of *Shabbat* as different from other days.112

For Modern Orthodox Jews, honoring the Sabbath as unique mandated putting away cellphones, laptops, and other information-age technologies. For a number of people, the compelling power of connectedness made it psychologically difficult to pause device usage. In a
2011 Israeli survey of 1,200 Modern Orthodox high-schoolers, 17.7% confessed to texting after Friday sundown, including 12.2% who called themselves completely Sabbath-observant, while 15.5% admitted web-surfing. For many, texting had become so integral to their lives that doing it over Shabbat simply didn’t feel wrong, especially once teenagers sensed that ‘everyone is doing it.’ Others felt guilty, but rationalized texting as only a minor violation of Shabbat. The alleged phenomenon even acquired a slang label, ‘keeping half-Shabbos.’

Modern Orthodox commentators regarded such breaches as a matter of internal discipline, seeking to combat behavioral patterns that defied community precepts. But within the exploratory progressive movement of Judaism, the non-profit group Reboot seized on cellphone overuse as a starting point for outreach, encouraging younger, less-strictly-observant men and women to find deeper meaning in modern life by creatively reinterpreting Jewish tradition. In 2003 Reboot created ‘The Sabbath Manifesto’, ten principles for incorporating Shabbat values into twenty-first-century living. Reboot’s first guideline for the Sabbath instructed, ‘avoid technology’; remaining counsel advised reserving the day to ‘connect with loved ones,’ ‘find silence,’ and ‘give back.’ It was no coincidence that Reboot’s list opened with ‘avoid technology,’ the recommendation that would seem most drastic to a generation that grew up with computers and carried cellphones everywhere. Reboot director Yoah Schlesinger described that advice as a step toward mental health, calling technology-free Sabbaths ‘a Jewish solution to a universal problem of tech addiction.’

In prescribing weekly pauses from information overload, Reboot reasserted Shabbat as sacred time that could help restore work-life balance to a hyper-connected age of distraction and stress. Starting in 2010, Reboot helped enthusiasts organize a ‘National Day of Unplugging’ that ran, not coincidentally, over the Jewish Friday-Saturday Sabbath. Deploying digital tools to liberate people from digital entanglement, the ‘Sabbath Manifesto App’ sent reminders to
disconnect, then notified contacts that users were temporarily unreachable. Picking up the millennial-oriented campaign to encourage non-Orthodox Jews and others to embrace unplugging over *Shabbat*, the Chabad-Lubavitch group Tech Tribe in 2010 began organizing Friday-night ‘island of serenity’ dinners at the South by Southwest Interactive Festival (SXSW) and later at Comic-Con San Diego. Tech Tribe urged event attendees to ‘[e]scape the chaos’ by switching off cellphones and enjoying relaxed face-to-face conversations for one evening. Three hundred participants joined ‘#openShabbat’ at SXSW 2016.\(^{115}\)

Social-media attention to the ‘National Day of Unplugging’ and its coverage in general media outlets helped spread the concept of a ‘technology Sabbath’ far beyond Reboot’s Jewish audience. By around 2012, a growing number of religious leaders and worshippers in Christian and Muslim faiths also embraced the virtues of a ‘technology Sabbath,’ embedding that notion within their specific religious practices as a strategy to set aside sacred time to build personal meaning and community. The idea became trendy, as entrepreneur/author Arianna Huffington and entertainer Katy Perry promoted ‘Shutoff Sundays.’ Others deliberately selected a weekday to unplug, regularly marking their ‘secular Sabbath.’ Silicon Valleyites such as Randi Zuckerberg linked this enthusiasm for ‘recharging’ to calls for ‘slow living’ and ‘mindfulness.’ Ironically, this mentality of ‘unplugging’ went viral. Followers texted, tweeted, Facebooked, and YouTubed about the rewards of a ‘tech fast’ or ‘digital detox.’\(^{116}\)

While observant Jewish people understood the principle of temporarily shutting off mobile phones within the long history of adapting their weekly habits to honor the Sabbath, the specific concept of taking a cellphone break resonated with some people outside that community in a non-religious context, reflections about the human price of connectivity. Concerns about the mental, physical, and social impact of ‘always-on’ communication linked to wider conversations about the place of work in twenty-first-century U.S. society, alongside evidence suggesting
growing economic inequity and insecurity. Especially when health insurance depended on employment, fears of vulnerability could easily lead people toward competitive over-work, at the risk of exhaustion, burnout, and family disruption. Business procedures of ‘just-in-time’ scheduling (facilitated by computer analysis and cellphones) multiplied anxiety and practical problems for retail and service-sector workers, especially when companies added or cancelled shifts at the last minute or assigned workers to back-to-back late-night/early-morning stints. Professional, managers, and white-collar workers experienced a different set of pressures, as email, texting, and other instantaneous-communication technologies insidiously spread organizational norms of 24/7 availability, resulting in what psychologist Larissa Barber termed ‘workplace telepressure.’ One study found that 41% of people expected coworkers to answer email within one hour, and another 36% expected a response before four hours. Another study concluded that just checking for work messages after hours damaged employees’ interpersonal relationships, since those repeated micro-transitions between roles disrupted engagement with significant others. Such toxic demands made U.S. work ‘shockingly inhumane’ and might cause 120,000 extra deaths per year, according to Stanford professor Jeffrey Pfeffer. By contrast, France passed laws in 2017 guaranteeing certain employees a ‘right to disconnect’ at night, on Sundays, and on vacation. Volkswagen, Daimler, and other German employers instituted measures giving workers similar control over personal and family time.

In the absence of such systemic solutions to limit work expectations in off-hours, some Americans outside the Orthodox Jewish community embraced an individual or family ‘technology Sabbath,’ in hopes of regaining at least some control over time. More than that, Reboot’s widely-cited ‘Sabbath Manifesto’ encouraged people to rethink the overall impact of technology on their lives. Reading Facebook posts, binge-watching television, or playing videogames did not represent ‘work’ the way that answering job-related emails did.
Nevertheless, Reboot maintained that true weekly health meant avoiding screen-time, in favor of face-to-face conversations and real-world activities, such as taking nature walks, picnicking, meditating, doing crossword puzzles, pursuing hobbies, baking cookies, planting flowers, and taking long road-trips. Recommendations for driving, cooking, and creating things all violated strictly-observant Jewish rules for Shabbat. But for Reboot and others who promoted a twenty-first-century ‘technology Sabbath,’ the point was not to enforce authentic obedience, but to promote the spirit of Shabbat as rejuvenating and special. Political philosopher Kathi Weeks has encouraged people to seek meaning in life beyond a whip-cracking work-ethic, defending ‘the potential social productivity of nonwork.’ Rather than dismissing ‘nonwork’ as an indolent, self-indulgent waste, Weeks interprets off-time as a strike against the oppressive structure of extreme industrialist capitalism, against obsessive consumerism, and against a personal identity reduced to job titles.119

Voluntarily adopting a ‘technology Sabbath’ allowed plenty of freedom; since limits were self-imposed, stretching or breaking the rules did not carry the accountability or guilt that conscientiously-Orthodox Jews felt when accidentally flipping light switches or activating dishwasher controls. Paradoxically, honoring a regular day of rest often entailed extra work ahead of time for observant families. Orthodox women frequently began shopping for Friday/Saturday meals on Thursdays or earlier, a routine that itself became part of the weekly calendar. To those happy in their faith, such complications and inconveniences represented a worthwhile tradeoff for enjoying the religious value, family time, and emotional depth of Shabbat.120

Conclusion
New developments in technology complicated religious observance, as seen in the proliferation of fancy oven, dishwasher, and refrigerator features that broke *Shabbat*, but also facilitated observance, thanks to the marketing of appliances that offered Sabbath-mode options. Light-timers, the KosherLamp, the KosherSwitch, the ShabbHOT water-heater, Zomet wheelchairs, and other *Shabbat*-oriented innovations all made Jewish life easier, for those families and rabbis who judged them legally acceptable. Indeed, by allowing (at least according to some authorities) partial access to electric light, warm water, and other modern conveniences on *Shabbat*, technological innovation may have facilitated the trend in recent years of some Modern Orthodox Jews edging toward stricter levels of observance. Traditions of Talmudic scholarship and Jewish culture promoted habits of constructive disagreement, producing differences of opinion that left room for individuals to interpret observance in varying fashion.

To outsiders, rulings prohibiting ‘normal’ use of elevators, light-switches, appliances, and similar objects one day each week may seem strange, authoritarian, or ridiculous. Any activity visibly demarcating Jewish people as following different customs could also raise social tensions with non-Jewish neighbors or pose potential risks, given the long history of anti-Semitism. But within observant environments, Sabbath constraints opened extensive discourse about the religious implications of how technologies actually worked. Modern Orthodox authorities and consumers unpacked the black box of common devices, then weighed detailed assessments of their operation against centuries-old tradition, religious-law precedent, and modern realities. When a device seemed to conflict with *Shabbat*’s special directives, entrepreneur-inventors pursued adaptations that satisfied community morals. Rabbis and engineers teamed up to create innovations that obeyed both religious commands and the usual laws of physics, aiming to help observant Jews keep *Shabbat* both holy and modern. Following the same aspirational consumerist trends as other middle-class American consumers, observant families shared a
pleasure in household goods that promised comfort and connectivity, while also embracing the ideal of celebrating their ancestral faith through weekly alterations in their normal patterns of living. Since rabbis vocally disagreed about minute details in the Sabbath implications of electrification, kitchen equipment, and cellphones, those debates gave Orthodox people opportunities to decide for themselves what counted as authentic devotion in handling personal and domestic technologies.

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1 Kraybill, “Plain Reservations”; Ems, “Amish Workarounds”; Umble, Holding the Line; Kraybill and Olshan, The Amish Struggle With Modernity; and Wetmore, “Amish Technology:.”
2 Pine, “Recharge.”
3 Eleff, Modern Orthodox Judaism; and Taubes, “The Delicate Power.”
7 Kress, “Orthodox Judaism Today”; and Wertheimer, “Can Modern Orthodoxy Survive?”
8 Orthodox Union website. See also Katz, “Wired At the Western Wall”; Gilgoff, “New App Takes Users.”
9 Bolton, “Lieberman Faces.” Despite Lieberman’s caution in avoiding a forbidden automobile trip, his willingness to cast a Senate vote on Shabbat drew disapproval from some fellow Jews, who criticized it as violating the spirit, if not the law, of observance. Kress, “Orthodox Judaism Today.” See also Lieberman, The Gift of Rest.
11 Genesis 2: 3; Exodus, 20: 8-10; Exodus, 31: 15-16; Jeremiah 17:22, The Jewish Bible. See also Leviticus 23:3 and many other references to Shabbat observance in the Torah.
15 For more detail, see Nevins, “The Use of Electrical and Electronic Devices.”
16 Shulevitz, The Sabbath World:.
18 Cowan, More Work For Mother; and Oldenziel and Zachmann, Cold War Kitchen.
19 Kalman, “Patents.” The list of Sabbath-related patents, other than those discussed in this article, includes items such as a 1946 proposal for a device to track synagogue donations on days when Jews were forbidden to handle money. “Synagogue Donation Recording Device,” U.S. patent US2514451A, July 11, 1950 (filed May 25, 1946). See also Neumann, “The Use of Electricity on Shabbat and Yom Tov.”

31 Broyde and Jachter, “The Use of Electricity on Shabbat and Yom Tov.” See also Nevis, “The Use of Electrical and Electronic Devices on Shabbat.”

32 Broyde and Jachter, “The Use of Electricity on Shabbat and Yom Tov.”

33 Jachter, “The Prohibition of Turning On an Incandescent Bulb on Shabbat and Yom Tov, part 2.”

34 Jachter, “The Prohibition of Turning On an Incandescent Bulb on Shabbat and Yom Tov, part 1”; and Jachter, “The Prohibition of Turning On an Incandescent Bulb on Shabbat and Yom Tov, part 2.”


37 Jachter, Gray Matter 2.


42 For a study of how twenty observant Jewish families adopted and viewed timers and “smart home” automation, see Woodruff, Augustin, and Foucault, “Sabbath Day Home Automation.” See also Brueck, “This Orthodox Jewish Rabbi’s Home.”

43 Broyde, “Timers on Shabbat and Yom Tov.”

44 “Shabbat 18 – Are We Permitted to Use a Shabbat Clock?”


46 Broyde, “Timers on Shabbat and Yom Tov.”

47 ZMAN Technologies.

48 “KosherSwitch - Control Electricity on Shabbat!”; Kosher Switch website.

49 “Kosher Switch” website. See also Heilman, “Is KosherSwitch Really Kosher”; Dvorin, “Could A New Gadget Change”; and Kalman, “Should We Laugh?”

50 “Two Rabbis Prohibit ‘KosherSwitch’”; “New York – Shedding Light on KosherSwitch,” and “Shluchim Differ.” See also, Zomet Institute, “A Kosher Switch”; and Brody, “The Kosher Switch.”

51 Abel, “Too Much Technology.”

52 HaRav Yisroel Belsky Writes Letter”; Heilman, “The Kosher Switch Might Not Really Be Kosher”; and “KosherSwitch Falsely Indicating.”

53 Ortner, “The Kosher Switch’s Flawed Foundation.”


55 Halperin and Zioni, “Indirectly Activatable Telephone System.”


57 Hayoun, “How To Be Religious.”

58 Skurow, “A New Use For Old Texts.”


61 Miller, “The Shabbat Scooter”; Zomet Institute, “Gramma.” See also Student, “Will the Kosher Switch Bring Mashiach?”

62 Zomet Institute, “Dairy Farming.” See also Haberman, “Alon Shevut Journal.”

63 Precker, “God’s Laboratory Engineers.” See also Ackerman, “Circumventing the Sabbath.”.
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“Sabbath Manifesto: The Ten Principles.” See also Morris, “A Day of Rest Enters the Digital Age.”


