CHI-nnabis: Implications of Marijuana Legalization for and from Human-Computer Interaction

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Abstract
The consumption of cannabis has substantial implications for medicine, popular culture, and technology use, yet discussion of it is almost entirely absent in the HCI literature. Taking advantage of CHI 2017's location in one of the first jurisdictions to legalize recreational use of marijuana in the U.S., this panel will discuss its socio-technical implications, identify HCI research themes relevant to policy and public health debates, and outline a research agenda.

Author Keywords
cannabis; marijuana; drug policy; legalization

ACM Classification Keywords
K.4.1 [Computers and Society]: Public Policy Issues

Background
While the use of cannabis (popularly: marijuana, pot, weed, ganja, grass, reefer, chronic, dope, herb) remains illegal under U.S. federal law, voters in an increasing number of states are proposing and passing ballot initiatives to legalize marijuana production, sale, and consumption for recreational purposes. In 2012, Colorado voters passed a ballot amendment to amend the state constitution to legalize recreational sale and consumption. As of 2017, seven other states (Nevada, Maine, Washington, California, Massachusetts, Alaska, and Oregon) now permit the

recreational sale and consumption of marijuana and there are pending ballot initiatives across many states to further decriminalize, permit medical use, or legalize recreational uses. As these policy changes accelerate not only within the United States, but across the world, policymakers, regulators, and the public will look to experts to provide guidance through complex social and technical questions.

We argue this policy change has substantial and on-going implications *for* and *from* researchers in human-computer interaction. Implications *for* HCI include understanding how new social and cultural practices co-mingle with information technology design and use. Implications *from* HCI include applying lessons about human-centered computing and collaborative work to the design of new systems. Since legalization went into effect in January 2014, this new local industry has seen rapid expansion [8, 9, 18].

It should come as no surprise that cannabis consumption intersects with the social uses of information systems [1]. Social media platforms like YouTube [11], Instagram [6], Craigslist [16], and Twitter [3, 4, 5, 10, 15, 17, 20] are filled with cannabis-related content and behavior. Other researchers have examined the anonymous online markets like Silk Road where controlled substances are exchanged [7, 21] as well as methods and ethics for researching online populations of drug users [2, 14].

However the analysis of cannabis legalization has largely been confined to public health [22] and policy research [13]. The broader HCI community is all but absent from these scholarly discussions about the design, use, and implications of socio-technical systems for cannabis consumption. A search of the ACM Digital Library finds very sparse coverage of papers discussing cannabis, despite its substantial influence in history, policy, and popular culture [12].

Relevant results from ACM DL keyword search

"cannabis" – 1
"marijuana" – 0
"weed" – 0
"pot" – 0
"legalization" – 0
"recreational drug" – 0
"illicit drug" – 1

We have identified four preliminary (but not exhaustive) themes for the panel that intersect a broad set of research topics within HCI: regulatory compliance, data analytics, community support, and knowledge management. This panel will outline the boundaries of a socio-ecological framework to understand the influences on cannabis uses within the context of environments where people live and interact. Specifically, this involves understanding multi-level processes such as changes in the policy environment at a macro-level, social and technological disruptions at a community level, and individual behaviors at a micro-level [19].

Regulatory compliance

Legalization policies require different user roles to collect and submit data into centralized database systems.

Multi-stakeholder usability. Regulators require producers and retailers to regularly submit detailed data about yields, potency, inventory, and prices. What lessons does HCI provide for implementing ambiguous legislative language into systems or ensuring usability across diverse (and reluctant) stakeholders?

Privacy. Databases of consumer or producer information may be legal at the state level, but they could carry significant civil or criminal penalties at the federal level. How can these systems be designed to protect the privacy of users? What are risks of associating one's online identity with cannabis content within social networking or e-commerce sites?

Law enforcement. Criminal organizations have historically exerted substantial influence over the production and distribution of cannabis. What kinds of data should be used by or insulated from law enforcement to deter criminal activity? How can systems be designed to support greater compliance and fairer enforcement?

Data analytics
Commercial cannabis entrepreneurs are collecting large and diverse kinds of data to improve their decision-making.

Genetics and phenotypes. Cannabis breeders invest significant resources to retain and amplify desired genetic traits in their strains. Which data sources and analysis methods are being prioritized for decision making? What are social and technical barriers to the broader adoption of bioinformatics tools and methods?

Marketing and sales. State regulations and media policies bar retailers from traditional strategies for advertising and customer tracking. What marketing strategies do firms use to attract and retain customers? How can online surveys, digital ethnography, and log analysis be used for feedback and forecasting? How does consumption integrate with other modes of interaction?

Health and safety. Cannabis can be consumed in many ways with varying health benefits and risks. How do users track their consumption as a part of "quantified self" practices? How can human-centered design approaches improve the safety and novelty of cannabis consumption with information or design interventions?

Supporting communities
Consumers are organizing online and offline communities to socialize together, market goods, and politically mobilize.

Destigmatization. Recreational cannabis users confront stereotypes and other stigmas around cannabis use. How are existing platforms like Facebook, Amazon, or YouTube managing the presence of cannabis content in their community? What new communities are emerging and what existing affordances are they adopting versus developing new interactivities?

Newcomers. Existing cannabis-related communities are confronting influxes of new users unfamiliar with existing norms. What strategies are effective for socializing newcomers into existing communities? How are these communities changing their social and technical architecture to capture new community members?

Political mobilization. The tenuous legal status of cannabis use in many jurisdictions requires on-going lobbying and activism. Firms like AirBnB and Uber have attempted to mobilize their users to take political action around policies affecting them. How is the cannabis industry similarly mobilizing customers to take political action?

Knowledge management
Previously marginalized knowledge is being translated into formal systems to support innovation and collaboration.

Folk knowledge. Artisinal practices developed as an illicit activity face commercialization pressures following legalization. What breeding strategies, phenotypical traits, and other folk knowledge are translated into quantifiable metrics and reproducible processes? How are cannabis firms aligning qualitative and quantitative data?

Social sensors. "Canna-seurs" document the smell, taste, texture, and effects of different strains and share these results with each other. How can these self-reports be aggregated to make recommendations or be aligned with other data? What user experience frameworks can guide customer and breeder decisions?

Collaborative work. Many cannabis-specific social computing systems exist to document and organize information about different strains, brands, recipes, *etc.* How successful are cannabis-specifc platforms in emulating the success of other computer-supported collaborations? What kinds of knowledge do these communities and systems prioritize for classification?

Panel Format

Preparation: The themes outlined above as well as invitations to pose questions would be publicized via social media platforms, *e.g.* Twitter's #CHI2017 hastag in advance of the panel.

Schedule: Over the course of the 80-minute session, the panel will:

- 1 minute introduction per panelist (5 min)
- Giggle mitigation ice breaker (5 min)
- Introduction of starting themes (10 min)
- Polling audience for additional themes (10 min)
- Discussion of starting and audience themes (30 min)
- Moderator provocations and responses (10 min)
- Outlining and funding a research agenda (10 min)

Other implications

Cannabis legalization also has many other potential implications for HCI researchers working around accessibility (*e.g.*, designing systems to manage side-effects for medicinal users), critical HCI (*e.g.*, tracing power structures migrating into new sites), and identity (*e.g.*, underrepresentation or exploitation of marginalized groups). The panelists, moderator, and audience will work to surface these additional themes during discussion.

Panel Objectives

The fundamentally interdisciplinary nature of the HCI field, CHI's large and global audience, the accelerating changes in the cannabis industry, and the conference's location in Denver all make this the right time and place to convene the first forum in an ACM venue to discuss the socio-technical implications of cannabis legalization.

Integrate new perspectives. Starting from the themes identified above, panelists and the audience will introduce additional HCI perspectives on the implications of cannabis legalization for an information society.

Explore a socio-ecological framework. Extending existing public health frameworks [19], the panel will discuss how technologies interact with social and cultural processes to influence cannabis use.

Outline research agenda. This discussion will help the HCI community outline research agenda to understand the social, technical, and ethical implications of cannabis legalization for human-centered technology design.

Identify funding models. The irregular legality of cannabis possession and consumption makes it difficult to research outside of "prevention" and "abuse" policy frames. What are alternative frames or funding models for supporting research into post-legalization cannabis use?

Organizers and Panelists

The panelists below have been selected on the basis of their research experience on topics around cannabis use within social media (Cavazos-Rehg, Paul, and Nguyen), exploring the adoption of data science methods within the industry (Keegan), using social media to study sensitive populations (de Choudhury), and examining how communities cope with consequences of drug trafficking (Savage). Building on his experience as a leader in the CHI community, Kaye will serve as a moderator for the panel and will be responsible for the giggle mitigation ice breaker, managing the discussion with the audience, and introducing provocations for panelists to discuss.

Brian C. Keegan is an assistant professor in the Department of Information Science at the University of Colorado, Boulder. He uses computational social science methods to study the structure and dynamics of high-tempo online collaborations and is exploring how the cannabis industry is adopting data science and social computing tools.

Joseph 'Jofish' Kaye is Principal Research Scientist at Mozilla. His research interests include domestic technology use, open data, and HCI at multiple scales ranging from ethnographic enquiry to big data analysis.

Patricia Cavazos-Rehg is an Associate Professor of Psychiatry at Washington University School of Medicine. She is a clinically-trained licensed psychologist whose research focuses on understanding how policy and social media shape health risk behaviors of young people.

Munmun de Choudhury is an assistant professor in the School of Interactive Computing at the Georgia Institute of Technology. Munmun's research interests are in computational social science, with a focus on reasoning about personal and societal well-being from social digital footprints.

Anh Ngoc Nguyen is the CTO and co-founder of Saolasoft, Inc. in Colorado. His company conducts research and development in mobile applications, big data, and social media mining to analyze health and social behaviors.

Michael J. Paul is a founding assistant professor in the Department of Information Science at the University of Colorado, Boulder. He uses machine learning and natural language processing methods to identify human behavioral patterns in the context of public health, computational epidemiology, and computational social science.

Saiph Savage is an assistant professor in the Department of Computer Science and Electrical Engineering at West Virginia University and an adjunct professor at the National Autonomous University of Mexico (UNAM). She has been studying how communities collaborate online and offline to survive the drug war and created collective action systems where citizens can collaborate to overcome drug problems.

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