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LAW-U: Legal Guidance Through Artificial Intelligence Chatbot for Sexual Violence Victims and Survivors

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ABSTRACT Sexual violence is a severe and chronic occurrence around the world that has not been resolved. The stigmatized nature of sexual violence has forced victims and survivors to accept prejudiced accusations cultivated from discriminatory norms when they are never at fault nor responsible for such violations against their sexuality. LAW-U is an Artificial Intelligence (AI) chatbot that gives legal guidance to survivors of sexual violence by recommending the most relevant Supreme Court decisions to the survivors' situations. In Thai, "LAW-U" — pronounced similarly to "ລາວອຸ່ນ" — means "I will wait for you", which signifies the chatbot's unconditional support to the user. 182 Thai Supreme Court cases of sexual violence, relating to Sections 276, 277, 278, and 279 of the Criminal Code, were used to develop Natural Language Processing (NLP) pipelines for LAW-U. Legal experts then generated mock-up dialogs from Supreme Court decisions which became the conversations used to train LAW-U. The computation of the similarity scores and the calculation of percentages of common keywords and keywords' synonyms were completed to increase the model's accuracy. When applying the model to the hold-out testing dataset, the accuracy was 88.89% for an exact match between the user's input and the Supreme Court case — this confirmed that LAW-U was ready for real-life application. LAW-U's unique design hopes to act as a precedent for other works at home and abroad to perpetuate awareness of sexual violence and eliminate any tolerance against these crimes by empowering sexual violence victims and survivors to reaffirm their inherent rights.

INDEX TERMS Thai sexual violence law, sexual violence, legal artificial intelligence, chatbot, natural language processing.

I. INTRODUCTION

Sexual violence is a persisting issue that impacts people and societies worldwide; it also poses a critical health challenge detrimental to the physical and mental wellbeing of individuals regardless of age or gender [1]. The World Health Organization (WHO) reports that 1 in 3 women worldwide are estimated to be subjected to partner sexual violence or non-partner sexual violence in their lifetime [1].

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Minimal statistical analysis has been attributed to sexual violence towards men and individuals in the LGBTQ+ communities [2]. Sexual violence is defined as a sexual act or any attempt to obtain a sexual act against one's sexuality by violence or coercion regardless of relationship between perpetrator and victim, and regardless of setting. This definition encompasses a variety of degrees of the use of force, including sexual harassment and sexual assault [1].

In the height of the COVID-19 pandemic, sexual violence has posed an even starker detriment as lockdowns have exacerbated the risks of sexual violence against women as families

cope with increased stress and are in closer contact with one another [3]. Most importantly, the WHO highlights that services like crisis centers and hotlines for victims and survivors, including legal aid, have been scaled back during the pandemic, making it harder for these individuals to gain access to critical support networks [4]. The United Nations (UN) similarly acknowledged that containment measures during the pandemic compounded the underreporting of sexual violence – an already chronic occurrence due to factors such as perceived stigma, fear of retaliation, and insufficient services for survivors [5]. While sexual violence has shown a declining trend across both genders in the Global North and Global South in recent years, it is unclear whether this trend accurately reflects reality as varying cultural contexts and norms create different understandings of what constitutes “perpetrator”, “victim”, and “sexual violence” [6]. The terms sexual violence “survivor” and “victim” will be used throughout the study. The study denotes “survivor” as meaning someone who has been through a sexual violence incident, while “victim” denotes someone currently involved in a sexual violence incident. The current stage of the research focuses on targeting survivors who have been through sexual violence experiences. Further works are to include emergency services that can immediately aid sexual violence victims.

The prevalence of sexual assault and harassment is at large in Thai society, confirming the notion that they should not be overlooked. The Royal Thai Police reported that there have been more than 4,000 cases regarding sexual violence with more than 8,000 victims in the years 2017 to 2020 alone [7]. Yet, the Thailand Development Research Institute (TDRI) states that unreported incidents of sexual violence against women could be as high as 87% with as many as 30,000 rape cases per year [8]. A 2019 YouGov Omnibus Research Poll surveyed 1,107 Thais and claimed that one in five Thais had said to experience sexual harassment. 57% of people who have experienced sexual harassment had reported or told others about it. This poll also notes that sexual harassment is as prevalent in men as it is in women (18% and 23%, respectively) [9]. Yet, sexual abuse towards women and children sharply increased between 2007 and 2013 as individuals who reported the abuse to Thailand’s One-Stop Crisis Center (OSCC) escalated to nearly 60%. Nevertheless, only 10% of individuals who called OSCC had reported the incident to the police [10].

This vast underreporting of sexual assaults may have stemmed from the relationship between the victim and the perpetrator. Most of the victims interviewed in a study of sexual assault victims in Police General Hospital had indicated that they were acquainted with the perpetrator. 50.3% of the adolescent victims were assaulted by their boyfriends [11]. Moreover, the underreporting may have precipitated from a variety of underlying normative reasons in Thailand’s culture. The YouGov Omnibus Research Poll reported that the reasons why individuals did not report sexual harassment included embarrassment (46%), the assumption that the reporting would be futile (27%), societal or cultural pressure (25%),

and fear of backlash (25%) [9]. Moreover, a study that viewed the correlation between perceived stress events, social support, and psychological impact of sexually assaulted women showed that social support had a non-significant statistical relation to one’s psychological impact of the crisis [12]. Consequently, sexually assaulted women turned to emotional-focused coping rather than problem-focused coping [12]. This illustrates the insufficient support system for sexual violence survivors in Thailand and its ineffective means to help survivors cope with trauma.

Conservatism in Thai culture plays a prominent role in shaping the general public’s mindset around sexual violence. Thaweesit and Boonmongkol state that sex education in Thai schools is not on par with contemporary standards and international practices [13]. This is because traditional preconceptions shape the mindsets, duties, and beliefs of actors in charge of these programs. For example, the attitude that “sex is distasteful and obscene” largely clouds sex education teachings that could otherwise be held in a neutral fashion [13]. Students are then susceptible to the internalization of these norms portrayed in the Thai education system, which eventually shapes how they act in society. Furthermore, many curricula also advocate abstinence-based sex education, which, in turn, fail to recognize sexual rights and sexual diversity, among many other things. This belief that society should remain pure and the act of pitting ethics and morals against sexual intercourse is the reason why victim-blaming occurs [13].

Madden describes victim-blaming as a “deep-rooted and multifaceted problem” in Thai society as many find it hard to believe that events like sexual assault can occur [10]. From articles that advise women to not dress in a revealing way during Songkran celebrations to the address of the 2014 rape and murder of a British tourist, Thai government officials continuously blame sexual crimes on the victims [10]. Additionally, Manopapiboon *et al.* and Ratinthorn *et al.* both argue that highly stigmatized professions such as prostitution render few discussions about the high risk prostituted persons have from sexual assault [14], [15]. Principally, due to the perception that violence in prostitution is an inherent risk of the trade, prostituted persons often do not document or report sexual violence to officials [15].

On a similar tangent, the discussion of patriarchy and hierarchies is overwhelmingly the central focus of many works regarding sexual harassment and sexual assault in Thailand [13], [16]. Conservatism norms in Thailand mainly assert that female adolescents should be virtuous and maintain their chastity. Thaweesit and Bonmongkol state that this approach targets women as the apex of sexual discourse as society inherently believes that it is in female adolescent nature to refuse male sexual advances and know what the opposite sex is thinking about to avoid sexual intercourse [13]. This power-relation dynamic is even more accentuated in sexual abuse and harassment in workplaces. Sonthornpasuch details that sexual harassment is embedded in hierarchical societies [16]. The traditional mindset that

“civilians are often subordinated to government officials in positions of authority” and women are subordinate to men allows for significant exploitation by people on a higher hierarchy to someone in a lower hierarchy [16]. Moreover, patriarchal ties are gravely present in victim-blaming as a portion of public responses to sexual harassment call for women to behave and dress in a proper manner to avoid being sexually harassed by men [13].

Thaweesit and Boonmongkol also cite double standards in justifying sexual conduct between men and women as one of the core reasons women deter bringing their cases to court [13]. Nevertheless, this patriarchal society and equating toughness and masculinity to men – creates a void in discussing sexual harassment and abuse against men. This is also reflected in Thai literature that primarily discusses sexual offenses against women and dismisses discussing cases in men partially because of the higher coverage of sexual abuse and harassment against women. The continuous spiral of centering the discussion on sexual offenses against women pushes back any recognition of sexual offenses against men – this is highly detrimental as it clouds facts of reality and dismisses men as victims. However, relatively recent literature by Laeheem and Boonprakarn identifies that domestic violence in married couples can occur from male or female perpetrators [17]. While this raises more discourse between gender and sexual abuse, there is a significant lack of address towards sexual abuse and harassment faced by non-binary genders.

Thus, heteronormativity is seen as the basis of most literature, while sexual abuse and harassment against the LGBTQ+ community is rarely discussed. Even in the small field of discourse on this matter, sexual violence against transgender people is viewed in the case of prostituted persons rather than in a “mundane” setting. For example, Davis *et al.* interviewed 60 transgender prostituted persons in Bangkok. They identify that transgender people and other LGBTQ+ people are “commonly excluded from national discussions on vulnerability in Thailand” even though 25% of the transgender people they interviewed were sexually abused in the past year [18]. Similarly, Guadamaz *et al.* and Chemnasiri *et al.* also remarked that transgender people have more cases of reported rape than male-male and women-male couples [19], [20]. Many times, the general public wrongfully connotes transgender people as risqué and as “people who engage in deviant or inappropriate behavior” [13]. This stereotype may cause people to unjustly believe that sexual violence is an ordinary situation in the lives of transgender people and even extrapolating to the rest of the LGBTQ+ community. Apart from a small discussion of transgender cases, there is a lack of literature that addresses sexual abuse and harassment in and against LGBTQ+ communities.

Existing literature also discusses sexual harassment in the context of Thai law and the effects it has on Thai society. Thaweesit and Boonmongkol [13], and Soonthornpasuch [16] both discuss the deficiency of clear sexual harassment laws in Thailand. Both discuss Thailand’s acceptance

of the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW), which entails Thailand to be responsible for dealing with sexual harassment issues. Nevertheless, this discussion is still centered around the protection of sexual harassment against women and does not discuss the offenses against other genders even though they deserve equal recognition. The authors also emphasized that the act of sexual harassment is not clearly defined which poses a great issue [13], [16]. Thaweesit and Boonmongkol state that the legal protection of Thai people from sexual harassment can be implied through the Criminal Code. For example, Section 276 discusses rape, Section 278 discusses indecent behavior, Section 287 discusses the distribution or exhibition of pornography or obscene printed materials, and verbal sexual harassment can be implied through Section 326 and Section 393 [13]. Nevertheless, Soonthornpasuch and, Thaweesit and Boonmongkol both indicate that the law does not clearly recognize sexual harassment in the Criminal Code provisions and only recognizes indecent acts, sexual assault, attempted rape, and rape [13], [16]. This lack of an explicit address affects “people’s understanding of and sensitivity to” sexual harassment incidents and deters victims from filing complaints about any incidences [13].

This is reflected in the responses detailed in Limpaphayom *et al.*’s study of sexual harassment perceptions in Thai respondents as compared to American respondents [21]. The variety of responses to the Likert-scale type questionnaire about sexual harassment scenarios signals the difference in understanding sexual harassment. Limpaphayom *et al.* state that it is possibly due to how “Thai law fails even to define sexual harassment behaviors” [21]. On a similar trajectory, this is also echoed in Komipote’s study on sexual harassment, violent abuse, and discrimination towards female workers in Thai export industries [22]. Sexual harassers in these workplaces do not get penalized unless in extreme instances of violent abuse. While this may stem from indifference in the managers, it may also be from the lack of knowledge about what defines sexual harassment [22]. Komipote indicates that laws should be reformed to increase the protection of women; women also need to be educated about their rights to protect themselves from these abuses [22]. However, while there is a discourse about sexual harassment in the context of Thai laws, there lacks discussion of sexual harassment against males and the LGBTQ+ community [2].

The literature discusses cultural underpinnings of conservatism, patriarchy and power hierarchies, and how heteronormativity in Thailand largely cultivates the general responses towards sexual abuse and harassment. This raises issues on social and cultural factors that largely contribute to how certain sexual assault and sexual abuse victims do not bring the offenses forward to prosecution or the police.

As our study focuses on AI chatbot solutions to console sexual violence victims, examining other works in the field is vital to the development of our AI chatbot and to identify the void that our study needs to fill. There are a few AI chatbots

TABLE 1. A summary of the proposed chatbot (LAW-U) including its advantages and disadvantages in comparison with other international and domestic chatbots that offer services regarding sexual violence.

Chatbot	Main Function	Advantages	Disadvantages
Hello Cass (Australia) [25]	“SMS chatbot providing discreet access to localized, accurate information and support for people experiencing or affected by family and sexual violence.”	<ul style="list-style-type: none"> Developed in consultation with organizations in community health and prevention of violence against women sectors. Includes counseling services and gives information about safety planning and building stronger relationships. Partnered up with other services and resources and also gives information to survivors who have immigration or LGBTQ+ needs. Chatbot is trained based on real-time data from users allowing it to be more personal and friendly. Chatbot is able to provide training (through interactive quizzes, stories) on the signs of abuse and resources available to those in need. Equip survivors of domestic violence and gender-based violence with information regarding shelters, counseling services, and facts about the legal process. Has capacity to assist police investigations by providing survivors with information on how to best preserve crucial evidence. Designed for worldwide use and available for users who are currently subjected to domestic violence. Is discrete and leaves no digital trace as it is integrated into popular messaging apps. Acknowledged that most controlling partners have access to user's digital services. Safety of the victim and survivor is the highest concern when designing the app. Non-profit Designed to be inclusive of all ages, genders, and sexual orientation. Central focus on giving accurate and precise legal advice, backed by Supreme Court decisions and developed with legal experts. Provides an early access point of support and is easily and quickly accessible regardless of location in Thailand. Gives legal information tailored to their case and helps users become more comfortable in accessing a legal consultant. 	<ul style="list-style-type: none"> Only available through SMS (paid service). Mainly targeted to only women. Unable to provide assistance in situations of immediate danger.
rAInbow (South Africa) [23]	“Chatbot that is able to deliver tailored conversations to women facing domestic abuse in South Africa”		<ul style="list-style-type: none"> Directed more towards domestic abuse. Mainly targeted to only women, leaves out men as survivors despite discussing LGBTQ+.
MySis (Thailand) [26]	“Chatbot provides access to emergency support, legal and action-based knowledge as well as linkages to various services that can help from non-profit call centers, police to Juvenile and Family Court and more.”		<ul style="list-style-type: none"> Targets women, children, and the LGBTQ+ community but leaves out men. No safety protection measures in the case where perpetrators have access to victim or survivor's digital services. Only available in the Thai language.
Sophia, Kona Club (worldwide) [24]	“World's first chatbot in assisting survivors of domestic violence collect potential evidence and seek help.”		<ul style="list-style-type: none"> Focused only on supporting victims and survivors of domestic violence. Hard to give detailed and tailored legal advice as the law and legal systems vary depending on the country.
LAW-U (Thailand) (Ours)	“Chatbot through Line application that provides a confidential, safe environment for survivors of sexual violence to access legal advice tailored to their situation.”		<ul style="list-style-type: none"> Not an emergency service for users in immediate danger. Currently only available in the Thai language. Not a psychological counseling service.

open for use that aid sexual violence victims [23]–[26]. One of the examples of a chatbot that can be used worldwide is “Sophia” from Kona Club [24]. The creators characterized this chatbot as the first international service to assist domestic violence survivors in collecting evidence and seeking help. Its uniqueness is that, apart from being a chatbot, it uses AI to erase any digital traces of the potential evidence sexual violence victims send and stores it in a safe server. This is done to increase the victim's safety as they acknowledge that most controlling partners have access to the victim's digital services. Nevertheless, the downsides of this app are that it is mainly focused on supporting victims of domestic violence and, as it is available worldwide, it is harder for the chatbot to provide legal advice tailored to the law of the country the victim is from [24].

Additionally, there are some chatbots that are only used in their targeted countries. Outside Thailand, two prominent chatbots are “rAInbow” from South Africa [23] and “Hello Cass” from Australia [25]. Similar to “Sophia”, “rAInbow’s” main focus is on assisting domestic abuse victims, but it is only available in South Africa [23]. The chatbot's main strengths are that it can inform victims of the signs of abuse through stories and interactive quizzes and be trained based on real-time data, making it more friendly and personal. Nevertheless, the drawbacks are that the chatbot is mainly directed to domestic abuse victims and only towards women.

This leaves out discussion on male victims even though LGBTQ+ needs were incorporated [23]. Australia's “Hello Cass” expands beyond the other two chatbots and targets victims of both family violence and sexual violence. Its strengths are that the chatbot is developed through consultations with experts on the prevention of violence against women and community health development. It is also able to give information to the victims about healthy relationships and counseling services. However, like “rAInbow” and “Sophia,” “Hello Cass” mainly targets survivors who are women and the chatbot itself is only available through a paid SMS service [25].

Narrowing down to works in Thailand, there is a near lack of AI solutions in consoling sexual violence victims. The only publicized chatbot in Thailand is “MySis,” which seeks to provide emergency support to victims as well as give action-based knowledge and information on the legal process to victims and survivors [26]. As the chatbot was initiated by a police investigator working on domestic violence cases, the special function of the chatbot is that it can be used to assist police investigations by directing victims and survivors on how to preserve crucial evidence. Nevertheless, the chatbot mostly only targeted to Thai women – as the chatbot is only available in Thai – and the chatbot itself is female, as seen through the chatbot's written language. Moreover, while the chatbot gives information on the legal process,

it does not provide legal guidance as tailored to the victim's case [26].

The development of chatbots for sexual violence victims is a great addition to existing support networks as they ensure that sexual violence victims and survivors are easily getting the immediate assistance they need [23]–[26]. Our study aligns with the same mindset of prior works as we aim to devise an easily accessible tool that can be of great help to sexual violence survivors. Most of the works discussed mainly focuses on providing information and services to victims, whether it be recognizing the forms of sexual violence to preventing a violent relationship. A summary of notable, existing chatbots and their advantages and disadvantages are as seen in Table 1. Of the chatbots examined, none focuses solely on giving specific guidance on the legalities of the sexual violence cases.

Our study believes that taking legal action is a very critical step for sexual violence survivors in reasserting their inherent rights. As many victims do not report sexual violence crimes due to the conservative environment, taking legal action and getting help on how to do so is an essential factor in empowering survivors to step out of the constraining and conventional cultural boundaries in Thai society. Moreover, the law is constantly changing and developing. While amendments in the Thai Criminal Code may provide more justice to all parties, amendments may create further confusion for individuals not acquainted with the Thai law – this may act as a deterrence rather than an aid. This is especially problematic when those individuals are the victims that the amendments purposely seek to relieve.

Thus, these reasons contribute to the study's objective in creating a non-profit chatbot that can give legal guidance to sexual violence survivors of all ages, genders, and sexual orientations. The chatbot will be integrated into a popular messaging app (LINE) in Thailand to provide users easy and free access. As the chatbot is developed with legal experts and trained with up-to-date Supreme Court cases, the chatbot is able to provide an accurate and precise early access point for survivors of sexual violence to understand legal frameworks that surround their case and allow them to become more comfortable in accessing a legal consultant to proceed their case in Court. The chatbot also transforms complex Thai law and Supreme Court decisions – focusing on Sections 276, 277, 278, and 279 of the Criminal Code – into easily understandable layman terms ready for the user's further application. Section 276 regards rape, Section 277 regards rape of a child under 15 years of age, Section 278 regards indecent acts, and Section 279 regards indecent acts against a child under 15 years of age. When critical support networks and services are inaccessible and limited in resources, LAW-U fills gaps and acts as a supplement. Our study hopes to set a precedent for future projects that aim to support sexual violence victims and survivors. Most crucially, we hope survivors of sexual violence would use the legal recommendations that we and LAW-U prepared to empower themselves to take action against the violations.

Our study can be divided into five parts. In the first part, the importance of sexual violence law in Thailand was examined by highlighting its progression in Thai legal history and its eventual form as Section 276, 277, 278, and 279 of the Thai Criminal Code. The second part highlights the process in designing and developing our chatbot, LAW-U, including conversation design to match our targeted users and the implementation of Dialogflow. In the third part, we discuss how legal experts collected and refined raw data from Supreme Court cases to create data that will be used to train LAW-U. The fourth part describes our experimental design and setup. Five-fold cross-validation was used to evaluate the developed LAW-U chatbot on a limited data sample. Our ultimate goal is to make LAW-U chatbot understand the Thai language and Thai legal terminology. The fifth part of this article examines the experimental results by assessing the model's performance through the evaluation of its testing datasets and discussing which model would be best for LAW-U's application. The sixth and final part of this article will discuss the importance of the study's results in training LAW-U as well as its importance and contribution to the literature discourse. The section also describes future directions of the study as the study aims to constantly develop and improve LAW-U's capacity to fully achieve and go beyond the foundational objectives of this study.

II. THAI SEXUAL VIOLENCE LAW

Before delving into how our study can use AI to impact sexual violence victims, we analyzed the Thai Criminal Code laws pertaining to sexual violence. This can only be done by first examining the progression of the sexual violence laws and how they evolved through time and changes in Thai culture, acknowledging the complexities of contemporary society. This first subsection analyses scholars' interpretation on the progression of Sections 276, 277, 278, and 279 of the Thai Criminal Code from their developments in the period of the Three Great Seals to the more recent amendments of the Sections themselves. The study seeks to briefly explore and understand how the law has changed to reflect modern dynamics as certain Western legal concepts shift Thai legal systems and concepts surrounding gender neutrality become paramount in discussing sexual violence law. The whole section will allude to Section 276, 277, 278, and 279 of the Thai Criminal Code (B.E. 2563 or 2020). Their complete English translations for the most up-to-date version of the Criminal Code are found in the appendix of this article. Understanding the progression of these laws and the laws themselves is crucial to the study as the study's objective is to create a chatbot that can give legal guidance to sexual violence survivors.

A. LEGAL PROGRESSION OF THAI SEXUAL VIOLENCE LAW

Thai literature has discussed developments in law and amendments made regarding sexual offenses, and the progression to gender neutrality in Thai law. Both Phansuwan and Somjai compare sexual violence laws in the Criminal Code from the

Code of The Three Great Seals (1805) to the Criminal Code in the year their research was published (2005 and 2020, respectively) [27], [28]. Phansuwan, nevertheless, specifically delves into pre-modern Thai law by comparing the provisions of “ravish” and “indecent” offenses under the Royal Enactment against rape and indecent assault R.S.118 (1898), the Spouse Code (1904), and the Criminal Code for the Kingdom of Siam R.S. 127 (1908) [27]. From the past to the present, the ravish offense and indecent offense laws were influenced by Western legal concepts. This was through changes in how the Thai national legislation regarded sexual violence offenses as crimes, the definition of the act of sexual offense in the Thai law, and how they decided what constituted each of the varying acts of sexual offenses. On the other hand, Somjai also discusses how the Code of the Three Great Seals gave the rights of the female offspring to her parents, and inhibited her freedom, especially in sexuality rights [28].

However, the Thai code of law has transformed such that it now accounts for equality between men and women, contemporary social conditions, and modern customs and traditions [27]. Suttinee discusses the amendments of provisions on sexual offenses under the Thai Criminal Code and extends to describe how changes in societal beliefs, values, and the presence of improved social institutions have catalyzed the continuous amendments [29]. Starting with the ratification of CEDAW in 1989, amendments were gradually made to every Thai law that prioritized men over women [13]. Most importantly, the Thai Criminal Code’s definition of rape discarded the terms “any man that has sexual intercourse with a woman.” After that, the Thai sexual violence laws were consistently amended to become more gender-neutral. Around 2015, the Thai law was further amended to include a broader definition of rape to encompass sexual intercourse that was not only between conventional male-female relationships where only sexual organs were involved. This changed the law in Section 276 and 277 to include that sexual intercourse was the use of the offender’s sexual organs to do by any means with “the sexual organ, anus, or oral cavity of another person, or by using any object to do by any means with the sexual organ or anus of another person.”

The most current update of the Criminal Code for the sexual violence laws was in B.E. 2563 or 2020. The law was amended further to revise the definition of rape such that “sexual intercourse means an act done with the intent to gratify the sexual desires of the offender by using the sexual organ of the offender to invade the sexual organ, anus, or oral cavity of another person.” The most recent law also extrapolated the idea of gender-neutrality seen in Sections 276 and 277 by broadening the meaning of indecent acts in Section 278 and 279. This was amended by revising that “indecent acts involves the use of an object or an organ other than the sexual organs to invade such person’s sexual organs or anus.” Thus, these amendments made in the Thai law show the gender-neutral changes in the definitions of

rape and indecent acts as transformed by contemporary social forces.

Various works analyzed the incremental changes in these Sections, starting with Section 276, which describes the offense of rape. Kerdcharoen analyses the development of the law with regards to Section 276 of the Criminal Code Amendment Act (No.19), B.E. 2550 (2007) [30]. Prior to this revision of Section 276, the sexual offender was only defined as a “male” who had unlawful sexual intercourse with a female that is not his wife and through an ordinary course of action. Kerdcharoen detailed that this gender inequality in the law illustrates a gap that needs to be filled to account for circumstances in reality. Therefore, the legislators revised Section 276 B.E. 2550 (2007) to redefine that the offender and the victim could be male or female. Moreover, the amendment also changed the verb of sexual intercourse from “penetration” to “commit with” to introduce gender neutrality to the definition of rape. Somsathian says that this new definition of the word “sexual intercourse” creates implications to the interpretation of the law [31]. Similarly, Kerdcharoen believes this definition does not align with the spirit of the law that was intended to protect females as a vulnerable gender due to their risk of pregnancy [30]. While both authors discuss the amendments in recognizing gender equality of the crime in legal provisions, they also emphasize women as the typical victims of sexual abuse crimes, especially in spousal cases.

The phrase “who is not one’s wife” was also removed from this amendment such that both a husband and a wife could be accused of being a sexual offender [30]. While Kerdcharoen broadly examines the amendment trends [30], both Somsathian and Suriyakan specifically examine the development of legal provisions in the Thai Criminal Code for Section 276 – Amendment B.E. 2550 (2007) – which discusses sexual offenses in marriages without spousal consent [31], [32]. However, Kerdcharoen, Somsathian, Suriyakan all question how this amendment, which allows sexual violence in spouses to be recognized as sexual offenses, negatively affects the idea of a family institution [30]–[32]. This analysis alludes to Thai cultural underpinnings and more conservative norms relating to sexual violence and marriage. Nevertheless, this amendment recognized the equality of individuals and genders as it revised Section 276 of the Criminal Code to include sexual intercourse without spousal consent as rape [32]. This definition still exists in the current Criminal Code B.E. 2563 (2020). Yet, there is still controversy around this law as it allows for the punishment of spousal rape to be “lighter than that described in the law” or to be reduced to only behavioral control of the offender, as the Court sees fit.

Other scholars also similarly analyzed the changes made through time for Section 277, which describes the rape of a child under fifteen years of age. Leelaamornphan expands the discourse on the development of Thai sexual offense law to match the spirit of child protection and argues that the amendment of the Criminal Code (No.23), B.E.2558, does

not provide true justice for the child including the juvenile offender [33]. The last paragraph of Section 277, in Criminal Code (No.23), B.E.2558, does not provide justice. It specifies precedent conditions that a child or juvenile offender must perform to be granted relief or suspended sentence. This gap in the law also allows one to use the law as a tool to coerce the child or juvenile offender for monetary compensation or marriage in exchange for not being prosecuted [33]. Leelaamornphan also advises that a juvenile (not over eighteen years) should not be prosecuted when the sexual intercourse between child (over thirteen years but not over fifteen years) and juveniles is mutually consented if it is the first offense and is under the conditions that pertain to the last paragraph of Section 277 [33]. While the current Criminal Code B.E. 2563 (2020) removed the clause, the detailed events still occur outside the Court.

In addition, scholars evaluated the successes of the amendments and discussed areas for improvement in the law. Both Kerdcharoen and Somsathien advocate for improvements in the law so that the provisions are clear to prevent uncertainty of interpretation, especially in law enforcement [30], [31]. Petcharat also bases her study on the definition of sexual assault under the Thai Criminal Code and similarly advocates for clearly defined sexual offense laws as they greatly influence enforcement [34]. As legislatures cannot draft laws to cover all crimes, interpretations under the criminal law are very crucial – Petcharat believes the definition of sexual assault is a hindrance to this interpretation [34]. Petcharat brings up an example about upskirting and focuses on Thai Supreme Court Decision No. 12938/2558 (2015) that declares this act an indecent act under Section 278 of the Criminal Code [34]. However, Petcharat discusses that this Supreme Court decision goes against the Thai Criminal Code's definition of an indecent act. While upskirting does not require physical contact with the victim, Thai law denotes physical touch as a critical requirement of an indecent act; Petcharat advocates for the law to be made more clear such that Supreme Court decisions and the Criminal Code do not contrast one another [34]. Legal experts in our study also experienced this problem in the data collection process, as discussed in Section IV.

Another area where scholars believe there should be developments in law is sexual violence through electronic platforms or electronic communications. Stichantarku examines the lack of specific legal provisions regarding sexual offenses and child and juvenile sexual grooming through the internet. She asserts that the lack of legal provisions prevents law enforcement authorities from protecting children and juveniles through electronic communications and negatively affects the child's growth, physical health, and mental health [21]. Due to the constant technological advancements made, this is worsening and perpetuates grave damage to society. Stichantarkul recommends enacting legislation against sexual grooming; this can be through encouraging international collaboration in establishing authority to

examine and control internet usage or communication that may lead to sexual grooming [21].

In the scholarly discourse, there has been discussion on the developments in law throughout history, amendments to the Criminal Code to create the present sexual violence laws, and the effects on interpretation and law enforcement. The literature discussed also sheds light on spousal sexual offenses, sexual offenses between children and juveniles, and the internet as a medium for sexual offenses. Yet, all of these combine to present the existing void in literature that focuses on sexual assault and harassment in all genders, especially non-binary gender cases outside sex professions. There is also a lack of singular, multidisciplinary literature that discusses all of these issues and the amendments made in the law regarding sexual abuse and sexual assault. Our study discusses these issues to fill in the void in the literature and find a solution to many of the problems raised.

III. LAW-U: DESIGN OF LEGAL ADVICE CHATBOT FOR SEXUAL VIOLENCE SURVIVORS IN THAILAND

This section describes the process of designing and developing our chatbot, LAW-U. The study's chatbot is named LAW-U. The word "law" – while having its English meaning – has a similar pronunciation to a Thai word that means "stay" or "wait". Therefore, when spoken in Thai, LAW-U or "ລວມທູ້" means "I will wait for you" or "I will stay with you." Thus, this name reflects our aim of creating a chatbot that will wait for the user, a sexual violence survivor, and stay by their sides while they are braving through repercussions of the violations. The first part of the section describes the design of conversation and the style of language used in the chatbot to create an environment that is safe, private, and friendly such that the user feels secure in discussing their stories regarding sexual violence. The second step of LAW-U development focuses on designing and branching of the conversation storyline. This includes deploying the chatbot with Dialogflow, which describes the sequencing of questions and operations into different parts using a state machine. This is done to ensure clarity to the users so that they can retell their stories in an easy and accurate sequence. The chatbot will first ask the user to recount their sexual violence incident and answer questions. The information sent through the chatbot from the user will then be extracted and matched with three Supreme Court decisions that have the highest similarity value with the user's incident.

A. CONVERSATION DESIGN

The language used in LAW-U was designed to reach all users regardless of age or gender. In the Thai language, the gender of a person can be revealed by the words they use. Therefore, to reach all communities, including the LGBTQ+, LAW-U uses gender-neutral language so that the chatbot is not biased towards one gender or the other. This increases inclusivity and

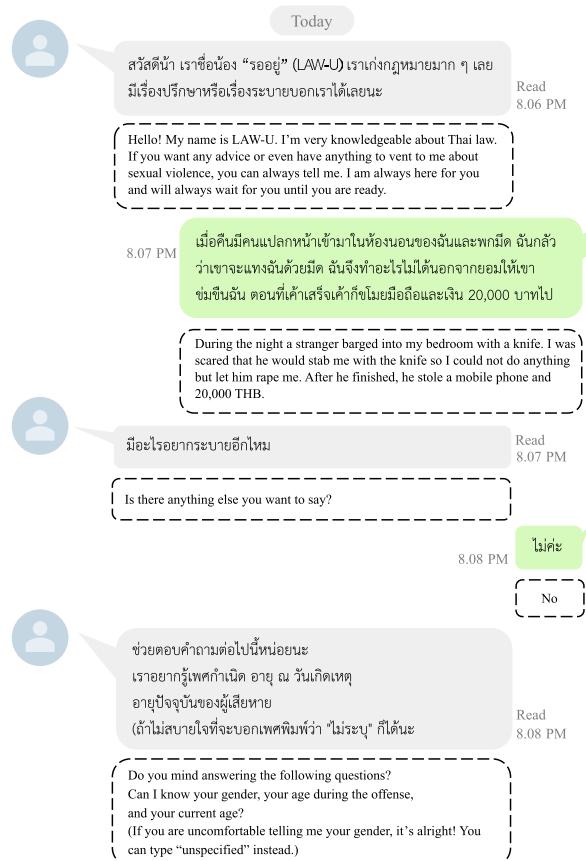


FIGURE 1. Example of a conversation between LAW-U and a user, showcasing the chatbot's friendly and tactful demeanor.

makes the user feels more at ease when talking to LAW-U. Moreover, LAW-U's messages were created using less formal and more conversational style language; this included replacing formal Thai terms with its colloquial Thai counterpart. This language style was developed to make users feel comfortable talking to the chatbot about intimate experiences as if they were talking to a close friend. An example of part of the conversation is shown in Fig. 1. Consequently, our study's primary target users are sexual violence survivors. Nevertheless, LAW-U was also designed to allow third-party users – consulting on behalf of sexual violence survivors – to use our chatbot effectively.

Figure 1 illustrates an example of chat conversation between bot and user through the official LINE messenger application. LAW-U's complete conversation for collecting data from users is as seen below:

- 1) Hello! My name is LawU. I'm very knowledgeable about Thai law. If you want any advice or even have anything to vent to me about sexual violence, you can always tell me. I am always here for you and will always wait for you until you are ready.
สวัสดีค่ะ เราชื่อว่า “รออซู” เราเก่งกฎหมายมากเลย มีเรื่องปรึกษาหรือ
เรื่องอะไรบ้างบอกเราได้เลยนะ

- 2) Do you mind answering the following questions? Can I know your gender, your age during the offense, and your current age? (If you are uncomfortable telling me your gender, it's alright! You can type “unspecified” instead.)
ช่วยตอบคำถามต่อไปนี้หน่อยนะ เราอยากรู้เพศ อายุ ณ วันเกิดเหตุ
อาชญากรรมของผู้เสียหาย ถ้าไม่สบายใจที่จะบอกเพศพิมพ์ว่า “ไม่ระบุ” ก็ได้นะ
- 3) Have you reported the incident to the police yet?
ได้ไปแจ้งความรึยัง
- 4) Have you undergone a physical examination yet?
ได้ไปตรวจร่างกายรึยัง
- 5) May I ask where the incident happened? How many times has it happened? How long has it happened for?
เหตุการณ์เกิดขึ้นที่ไหนหรือ เกิดขึ้นกี่ครั้ง เกิดขึ้นนานรึยัง
- 6) May I ask what kind of sexual violence it was? Was it a type of sexual harassment? If so, was it verbal sexual harassment or physical sexual harassment? If physical, was it internally or externally through penetration of genital area? Was it sexual assault or was it rape? Was there any coercion or threats made by the perpetrator? Was there coercion with violent intention or coercion with a weapon?

เรารอคุณได้ใหม่ว่าเป็นการลวนลาม กระทำชำเรา ข่มขืน ลักษณะไหน การรุกรานลาม การลวนลามทางเพศภายในครั้งเดียว หรือมีการสอดใส่ มีการพูดช่มชู่หรือพูดแสดงเจตนาทำร้ายหรือใช้อุปกรณ์ช่วยด้วยมือ

B. DESIGNING AND BRANCHING OF CONVERSATION STORYLINE AND DEPLOYING A CHATBOT WITH DIALOGFLOW AND FINITE STATE MACHINE DIAGRAM

The Dialogflow of LAW-U functions in a state machine format that classifies questions into sessions. The conversation design encourages users to gradually give LAW-U information and systematically recount all details so that important information is not left out. This is done to increase the precision and accuracy of the data being received from the user so that LAW-U can give accurate legal guidance. The chatbot is divided into four stages: a part that encourages users to express as much information as they want, a part that asks for the victim's information, a part that asks for the perpetrator's information, and a part that asks about further details on the incident. If there are multiple perpetrators in one case, once the user answers the number of perpetrators, users can provide detailed information on the next perpetrator after giving the previous perpetrator's information. An overview of the operation of the state machine is shown in Fig. 2. Once all of the information from the user is completed and verified, the chatbot will connect all of the user's messages and pass them through NLP pipelines (knowledge-based) to calculate 1) the similarity score from word embedding (spaCy similarity score), 2) percentage of common keywords, and 3) percentage of common keywords' synonyms.

The chatbot was designed using a Dialogflow that can be easily developed for future improvements. The sequence

of messages sent and questions asked by LAW-U, as seen in Fig. 1, will allow users to gradually compile answers regarding their incident. LAW-U's first message asks the user to relay all of the information they have on the situation. This was designed to establish a friendly relationship between the user and LAW-U, similar to asking one's friend to vent out all of their concerns. The messages that follow will ask for information about the victim, the perpetrator, and the incident. Legal experts had an integral role in designing the questions asked by LAW-U to ensure that the questions trigger answers that can produce the most comprehensive details for LAW-U to tailor legal recommendations to the user.

Once the user has answered all possible questions, the chatbot will display the user's answers for each question so that the user can verify the information and edit it if necessary. When all of the information is complete and confirmed, LAW-U will start providing legal guidance. Firstly, in the case where the user has replied to the chatbot that they have not reported the incident to the police nor have gotten a physical examination, LAW-U will start the advice by assisting the user on how to report the incident to the police and how to get a physical examination. These initial steps are fundamental in taking legal action as they are crucial to the outcome of the legal process [35]. Next, LAW-U will provide examples of three different cases and their Supreme Court decisions that have the top three highest similarities to the user's incident. This is done to give the user a general idea of how their case may proceed when the user decides to send the case to court. Thirdly, LAW-U will also provide contact information of relevant agencies or organizations that can protect the sexual violence survivor. The addition of this information is a baseline for all chatbots regarding sexual violence survivors and victims and must be included in LAW-U's messages.

IV. DATA COLLECTION

The study seeks to research and analyze qualitative data to gain a better understanding on the legal frameworks surrounding sexual violence and its corresponding Sections in the Thai Criminal Code. Moreover, the study places a large emphasis on analyzing and understanding Supreme Court decisions as precedents especially as Thai society and law has developed around existing Thai cultural norms and traditions. The data collected and organized from the Supreme Court decisions are then used through Natural Language Processing (NLP) techniques to train Artificial Intelligence (AI) into a chatbot that is able to tailor legal advice to survivors and victims of sexual violence. Legal experts have a dominant role in the data collection process as they collect, organize, and label Supreme Court case data that is then used as mock-up messages for training LAW-U.

A. DEKA – SUPREME COURT CASES AND DECISION

The first part of data collection is dedicated to collecting qualitative data from Supreme Court decisions for Section 276, 277, 278, and 279 of the Thai Criminal Code (as it pertains to sexual violence law) and how it was organized for further data

processing use in a dialogue system. The second part of data collection is dedicated to discussing the legal experts' role in selecting Supreme Court decisions that are accurate and up-to-date with the amended versions of the Criminal Code to create a precise model.

The Thailand Supreme Court judgments are published in three destinations: published in booklet form by the Office of Judicial Affairs, published by the Ministry of Justice (currently prepared by the Supreme Court), published by the Thai Bar Association, and published online by the Supreme Court through the "DEKA" website. All published Supreme Court decisions are abbreviated from the full verdict. The abbreviations are made into two types. One is a long version that shows the judgment process in all three courts as well as all the issues the Supreme Court has judged. The other is a short version that will detail only the issues the Supreme Court deems as critical in the case.

The data collected in this study was from the official online database of Thailand's Supreme Court decisions – DEKA – established by the Center for Information and Communication in the Thailand Supreme Court [36]. To make data collection more convenient for the research team and the legal experts, we programmed and created a database that organized the data from DEKA into Sections and split up long and short abbreviated versions of Supreme Court decisions. Decisions were also tagged if they corresponded to multiple Sections. Section 276, 277, 278, and 279 were selected to be the subject Sections of this research as they were the foundational laws regarding offenses against sexuality. This was decided on the evaluation that most would encompass all of the offenses detailed in the Supreme Court decisions and real-life cases.

Supreme Court decisions are significant in common law system countries as they are used as a source of law in the form of precedents, and rights can be derived from these judicial decisions [37]. While Thailand is a civil law country, it holds strong influences from the common law system; many lower courts use Supreme Court decisions as guidance and justification in determining what the judgments may be [38]. Likewise, Supreme Court decisions are also helpful for lawyers and legal consultants as they are able to advise clients according to the judgments made by the Supreme Court. Moreover, Supreme Court decisions uploaded on DEKA are the only accessible source of court cases fully open to the public, which is highly crucial as our chatbot needs to be trained with real cases to best support sexual violence victims and survivors. Therefore, data collection from Supreme Court decisions is essential in ensuring that LAW-U is able to give precise and accurate legal advice to our users.

Out of the 675 Supreme Court decisions on sexual violence acquired from the DEKA website and transferred into our initial database, 182 cases were extracted by three legal experts to create a second organization system that would be easy to input into the dialog system for NLP. Table 2 shows an example of how data was organized by legal experts in a form that is convenient for training the AI with the dialog system.

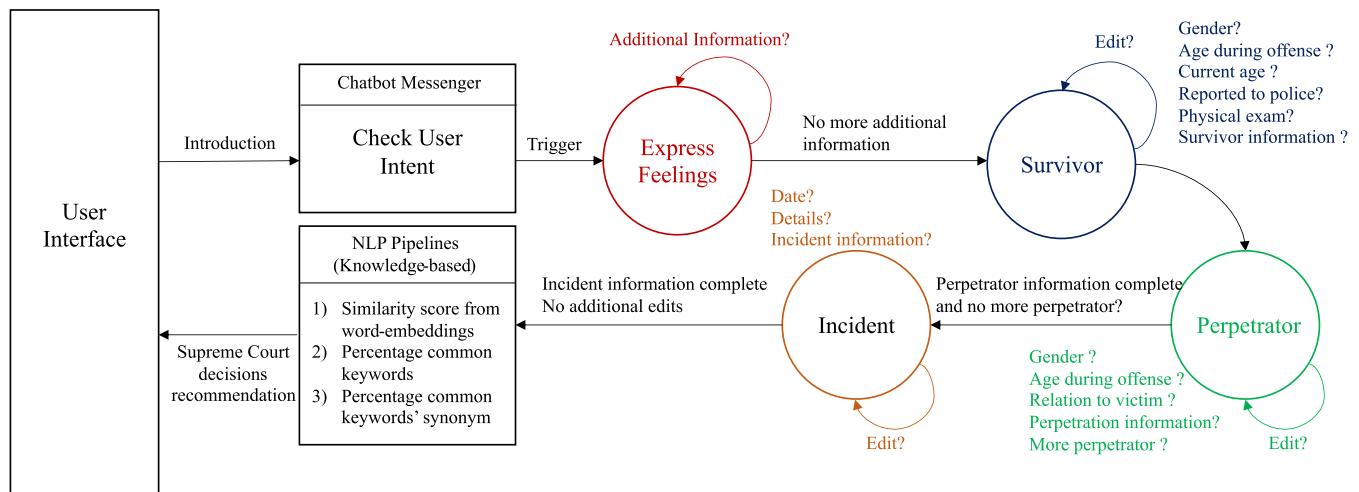


FIGURE 2. A conversational state machine diagram of the Dialogflow design for LAW-U chatbot.

The data extracted from the DEKA website (675 Supreme Court cases) to create our initial database included short and long versions of the Supreme Court cases. Examples of the Supreme Court cases from the DEKA website, along with its English translations, for Sections 276, 277, 278, and 279 can be seen in Table 2. This is the raw data that legal experts analyze and select important information for Dialogflow training to increase the accuracy and precision of LAW-U.

B. GENERATING CHATBOT'S INPUTS BY LEGAL EXPERTS

Legal experts' input and interpretations on selecting Supreme Court decisions for AI training is a crucial process to ensure that the most critical information is used for training NLP model. The NLP model from spaCy was created to account for the most accurate representation of current legal frameworks and how judicial decisions are being made in the present. Developing LAW-U through consultation with legal experts also increases the precision of the match between past judgments and information LAW-U users will be giving to the chatbot as legal experts are able to discern the cases that are the best fit and the most significant to act as precedent. The accuracy and precision brought forth by guidance from legal experts ensures that the advice tailored to our users will be most beneficial to their cases and that they are able to use this information to make legal decisions against the offense. The use of legal experts in every step of the data collection process is critical as legal knowledge is required to assess the data that is to be processed further. This is especially paramount when selecting the most up to date Supreme Court decisions to be used in the dialog system.

All Supreme Court decisions adhere to the Criminal Code for the year they are making decisions. Data collection included Supreme Court decisions from 1973 to 2020, spanning 47 years. During this period the Criminal Code and its individual Sections have been amended numerous times.

Decisions that were made based on Sections that have now been amended are null and not usable for NLP. An example is Supreme Court decision 1048/2518 which details that the plaintiff's appeal to the Supreme Court – that the plaintiff was raped by the defendant – is unfounded through Section 276 and 277 as the defendant's sexual organs penetrated the plaintiff's anus and not her sexual organs. The definition of sexual intercourse in Section 276 and 277, at that time, was only admissible if the perpetrator penetrated the victim through the victim's sexual organs and, thus, the decision regarded this offense as only an indecent act. This law has long been amended and as of the current Criminal Code B.E. 2563 (2020), Section 276 and 277 has been amended to include the act of committing against a person's anus as a definition of sexual intercourse. If not for the critical judgments of legal experts, including this Supreme Court decision could have become a substantial issue regarding accuracy in data collection.

Furthermore, many Supreme Court decisions blur the lines regarding an offense as being rape (pertaining to Section 276 and 277) or an indecent act (pertaining to Section 278 and 279). As seen in Supreme Court decision 12665/2556 and 4024/2534, the Supreme Court often describes rape as one of the offenses under indecent act when the violation towards the victim is a series of sexual offenses including rape. As per this definition, most Supreme Court decisions prosecute the defendant who violates the victim through a series of sexual offenses (which may include indecent acts) as only being guilty of only rape – the most severe punishment – even though rape is an offense under Section 276 or 277 as separate from Section 278 and 279. Combining them as one act is clearly contradictory to the Thai law as the Criminal Code clearly justifies the differences between the two. This issue is overcome in the data collection process and is clarified through discussion between legal experts as they use their expertise and knowledge in

TABLE 2. Example of short abbreviated versions of Supreme Court cases relating to Sections 276, 277, 278, and 279 of the Thai Criminal Code B.E. 2563 (2020) with English translations.

TABLE 3. Example of how legal experts organized and rewrote data for Dialogflow, translated into English.

Supreme Court Decision # 6905/2562 Victim	
“During the night a stranger barged into my bedroom with a knife. I was scared that he would stab me with the knife so I could not do anything but let him rape me. After he finished, he stole a mobile phone and 20,000 THB.”	
1) Gender	- Female
2) Age during offense	- The victim is under 15 years old.
3) Current age	- Unknown
4) Has the victim reported the offense to the police?	- Unknown
5) Has the victim undergone a physical examination?	- Unknown
Offense Details	
1) Where did the incident occur?	- The victim's bedroom, in her father's house.
2) How many times has it occurred?	- Once, at nighttime on the day of the offense.
3) How long has it occurred for?	- Length in minutes of the offense is unknown.
4) Details including what type of sexual violence (e.g. rape, sexual assault, verbal or physical sexual harassment)	- The offender trespassed into the house and went up to the victim's bedroom while holding a knife. The offender then proceeded to rape the victim. After he finished raping the victim the offender stole one mobile phone and 20,000 THB from the victim's father.
5) Were sexual organs involved? Was there penetration?	- There was penetration by the offender.
6) Was there coercion involved whether verbal, physical, or with a weapon?	- The offender trespassed into the victim's bedroom while holding a large knife. Before raping the victim, he placed his knife on the floor next to his body so that the knife was close enough for him to quickly pick it up. While raping the victim he did not pick the knife.
Perpetrator	
1) Perpetrator #1, #2, #3...	- Perpetrator #1 <ul style="list-style-type: none"> + Male + Unknown + Unknown
Supreme Court Decision	
Legal Experts' further comments on interpretation of the case and decision.	
-	

evaluating the conflicting legal frameworks and making sense of the Supreme Court decisions in order to create the most accurate and precise NLP model. An example of Supreme Court Decision 9797/2560 generated by legal experts is shown in Table 3.

Another problem that was encountered was that the amount of information given for each judgement was not equal and there were no standards of what a Supreme Court decision entailed. This can be attributed to the styles of each Supreme Court judge and counsel, and also varies throughout time. Furthermore, the abbreviated versions of the Supreme Court decisions do not disclose certain information due to the privacy of the litigation parties. Therefore, some of the data collected by our legal experts had missing information and were labeled as “unknown,” as seen in Table 3. Legal experts’ knowledge is used in the data collection process to evaluate which decisions will be selected and which decisions to be omitted.

V. EXPERIMENTAL DESIGN AND SETUP

This section discusses the experimental setup by focusing on how the data was prepared in training LAW-U to find the best matched Supreme Court cases from the mock-up inputs

by legal experts and for future usage by real users. The first subsection discusses the division and use of 182 Supreme Court case data – consisting of the short abbreviated, the long abbreviated, and the legal experts’ version – for stratified 5-fold cross-validation as shown in Table 4. The second subsection discusses the use of spaCy to compute the average similarity score between the given input sets by legal experts and the collected Supreme Court cases. The final subsection of the experimental setup consists of the extraction of common keywords between the Supreme Court cases and the mock-up message inputs from the TF×IDF algorithm [39]. It ends with a discussion on the use of NLTK’s Wordnet corpus to the search for synonymous words of the extracted common words in the 182 Supreme Court cases [40].

A. DATA PREPARATION FOR STRATIFIED 5-FOLD CROSS VALIDATION

Table 4 summarizes the number of Supreme Court cases as collected from the DEKA website, which is rewritten and organized by legal experts into groups according to the main Section it falls under.

The 182 Supreme Court cases consisting of the short abbreviated form, long abbreviated form, and the legal experts’

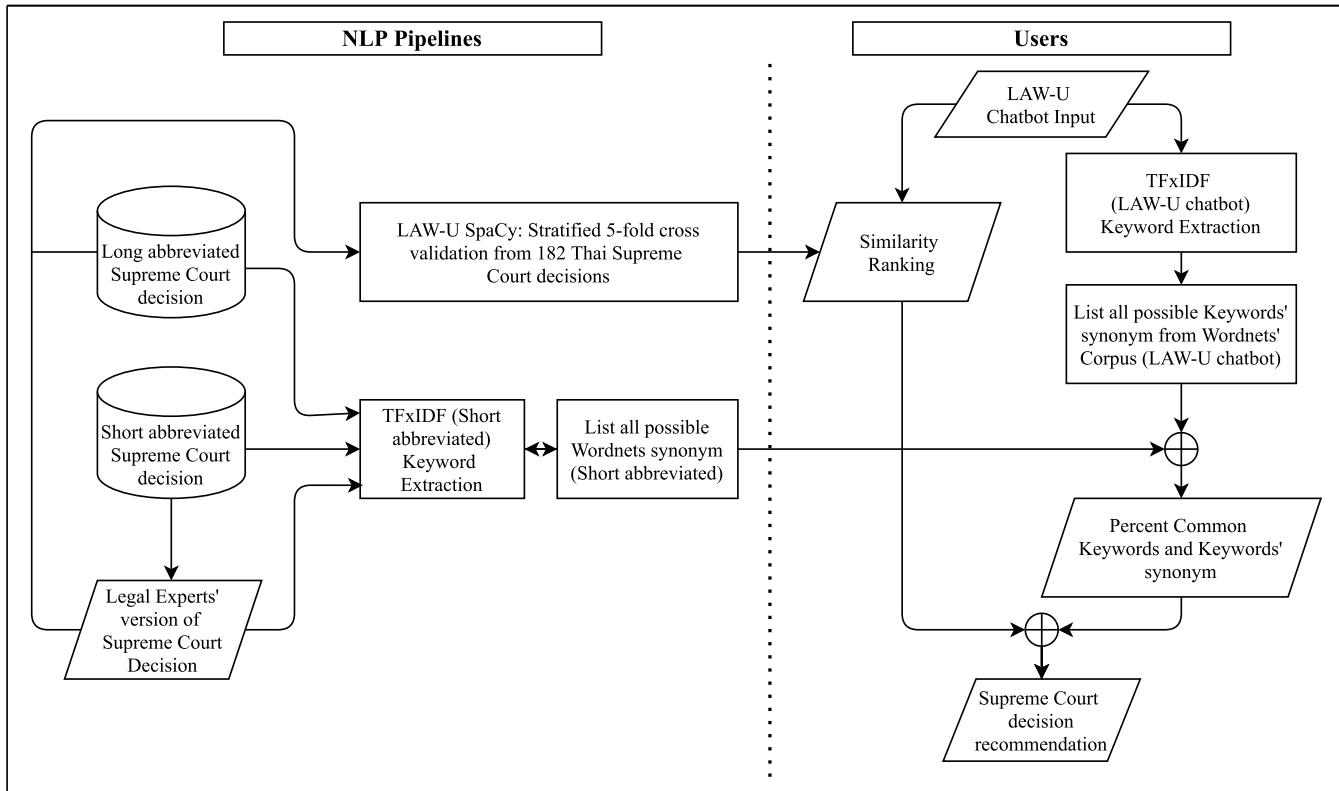


FIGURE 3. The overall systems of LAW-U: Artificial Intelligence Chatbot for sexual violence survivors.

TABLE 4. Number of randomly assigned items in each stratified 5-fold cross validation of data from 182 Thai Supreme Court cases on sexual violence in the form of short abbreviated, long abbreviated, and legal experts' versions.

Section	Fold-1	Fold-2	Fold-3	Fold-4	Fold-5	Test
276	9	9	9	9	9	5
277	9	9	9	9	9	5
278	7	7	7	7	7	3
279	6	6	6	6	6	3
278/279	2	2	2	2	2	1
Total	33	33	33	33	33	17

version are used as the input data for spaCy training [41]. The Supreme Court cases were selected for training and divided by legal experts into their corresponding Sections of the Thai Criminal Code. Fifty cases were used for Section 276, 50 cases were used for Section 277, 39 cases were used for Section 278, and 43 cases were used for Section 279. The number of Supreme Court cases for Section 278 and 279 also includes indecent acts with penetration by non-sexual organs. While, according to the Thai Criminal Code, this falls under Section 276 or 277, the Supreme Court, many times, rules that the cases are under Section 278 and 279. The legal experts in our team used their discretion to accurately place the cases in the Section that best fits them.

The division of the cases into the corresponding Sections is fundamental in creating a chatbot that is generalizable and

ready for wide, public use — dividing the data this way allowed for legal experts to maintain as much of a balanced dataset as possible without having data that is too biased towards certain Sections. These cases were then divided into five sets for 5-fold cross-validation training. k -fold cross-validation is crucial to the development of LAW-U. This is because a k -fold cross validation allows us to predict the performance of each learned model and compare performances of different algorithms in the model selection procedure [42]. Our study chose a 5-fold cross-validation to complete this test. The placement of items into each stratified 5-fold cross-validation was through random selection of the Supreme Court cases in each Section. Details of the number of Supreme Court cases divided in each fold are shown in Table 4. Additionally, 10% of the Supreme Court case data was extracted to test how the model would perform in a real-life application. Therefore, this data was not used in training and validation processes.

B. COMPUTATION OF WORDS SIMILARITY USING spaCy

SpaCy is an open-source software for NLP modeling, used in the production stage as it supports a deep-learning framework that allows users to train statistical models [41]. In this study, spaCy was used to train an NLP language model for Thai Supreme Court cases by building on a model from library NLP for the Thai language, also known as PyThaiNLP [43]. The model was trained with 182 Supreme Court cases

collected by legal experts from 675 Supreme Court cases. This included the short abbreviated versions, long abbreviated versions, and legal experts' versions.

Our study's main use of the NLP model from spaCy was to find the similarity score pairwise between the mock-up message input data and the total collected 675 Supreme Court cases. Finding the similarity score between the two data sources is optimal in choosing the best model in training LAW-U. Furthermore, the accuracy in computing for the semantic similarity of words is critical in determining the best model for machine learning [44]. The higher the accuracy, the better the model would perform in real-life applications. The training data in each document contains a generated input from legal experts, the short abbreviated, and the long abbreviated version of the Supreme Court decision case. Words and sentences in each of the Supreme Court cases were first segmented by PyThaiNLP [43]. Then, they were assigned with values in BILUO notation as provided by spaCy. These values were index of the token in the document (ID), Dependency Parsing (DEP), offset of token head relative to token index (HEAD), Part-of-Speech (POS) tagging, verbatim text of the token (ORTH), and Name Entity Recognition (NER) [41]. The NER values were derived from the head value in spaCy_thai, while the rest of the values were obtained from PyThaiNLP [41], [43]. The hyperparameter settings used to train the model in spaCy were the default configuration settings. The default settings fixed the max_steps score to 20,000 cycles and the dropout score to 0.1.

The computation of the similarity score between the user's inputs and all of the 675 Supreme Court decisions in our total dataset was calculated through computing the cosine similarity score of the word embeddings representation between the user's input and collected Supreme Court cases. The similarity scores of each pair were calculated and were combined with the percentage of common keywords between the mock-up message inputs and the Supreme Court cases. This will be discussed further in the forthcoming subsection.

C. TF×IDF FOR KEYWORD EXTRACTION AND FINDING KEYWORDS' SYNONYM FROM NLTK'S WORDNET CORPUS

The Thai language can be viewed as complex in the machine learning process and very different from the English standard because, for example, there are no spaces between words or any punctuation that marks the end of sentences [45]. As all of the input data in our study is in the Thai language, whether it be in the short and long abbreviated form or the form that was labeled and rewritten by legal experts, the searching for keywords in the Supreme Court case data cannot be done directly with raw data. Hence, before calculating the $\text{TF} \times \text{IDF}$ value to search for initial keywords, the text data was refined through the segmentation of words by word segmentation, and PyThaiNLP's word tokenization was used to label the end of sentences [43].

The segmented keywords from the Thai text data were then extracted from the multiplication product of the term

frequency (TF) and the inverse document frequency (IDF) [39]. The keywords with the highest $\text{TF} \times \text{IDF}$ score were then selected to find their synonyms through NLTK's Wordnet corpus [40]. Then, synonyms of these keywords were extracted and counted for their total number. This total number included the set of keywords and the keywords' synonyms. Finding synonyms of keywords is highly necessary to the training of LAW-U as most of the terms that appear in the Supreme Court cases are technical terms that are only in use in the legal field and not often found in conversational or messaging language. An example of this is the legal term for gang-rape in Thai: “**ทรมภกิจ**.” The synonyms found from NLTK's Wordnet corpus included “**ลงแขก**,” “**รุ่มทรม**,” and “**เรียบค้าขืนใจ**.” Another example is the synonyms “**ฉด**,” “**ยำ**,” and “**ชั่มชื่น**” that were found for the legal term “**ชั่มชื่นกระทำชำเรา**” which means rape. These Thai words are in the formal non-legal language, the colloquial language, and slang, which most likely will be found in the user's message inputs than their legal counterparts. Therefore, the additional training of our AI through synonyms is integral as it fulfills our objective of reaching a limitless Thai user base.

The percentage of common keywords and keywords' synonyms was derived from the ratio of the number of common words between the input data of the calculated keywords and synonyms and the keywords and synonyms from the abbreviated and full versions of the 675 Supreme Court cases. The Supreme Court cases with the highest ratio of common words were then ranked in ascending order.

Figure 4 shows an example of what the results would look like after LAW-U gives legal recommendations to the user. This is a continuation of the same case as seen in Fig. 1. LAW-U would provide the top three most similar results to the user's case and rank them in ascending order. The result with the highest similarity (TOP-1) with the user's case is presented in Fig. 4. The user's message is a rewrite of Supreme Court case 6905/2562, which was part of a test set that tested the performance of the AI's matches between the legal expert's version of the Supreme Court case and the short and long abbreviated versions of the Supreme Court case. The three top-ranking results, in order, are Supreme Court cases 6905/2562, 2269/2562, and 5547/2550. The TOP-1 rank shows an exact match as the user's message and the results are from the same Supreme Court case: 6905/2562. This generation of an exact match relied on the AI's ability to optimize for the best results while altogether considering the spaCy similarity score, the common keywords, and the synonyms. The spaCy similarity score for the third match showed the highest score out of the three ranks — if the model were to be trained with only this spaCy similarity score, then the LAW-U would have conjured 5547/2550 to be a TOP-1 match with 6905/2562. This would not have been accurate. Therefore, when combining the spaCy similarity score with the similarity score for the common keywords and the synonyms, LAW-U was able to optimize between the three scores and generate an exact match. LAW-U's AI

<p>Today</p> <p>User's Case Summary:</p> <p>User</p> <ul style="list-style-type: none"> - Female under 15 years old <p>Offense details</p> <ul style="list-style-type: none"> - Occurred once at nighttime in the victim's bedroom. Armed with a knife, the offender trespassed into the house and proceeded up to the victim's bedroom. After that, the offender raped the victim. When he was finished, the offender stole one phone from the victim's father as well as 20,000 THB. - There was coercion. - There was penetration. - There was coercion involved with a large knife. With the knife in his hand, the offender trespassed into the victim's bedroom. He placed his knife on the floor next to his body before raping the victim, so it was close enough for him to easily pick it up. He did not hold the knife while raping the victim. <p>Offender</p> <ul style="list-style-type: none"> - Male, Stranger to the user. <p>Do you want to give any additional information to me? You can also type "reset" if you want me to forget all the information you sent and restart the conversation all over again.</p> <p>Read 8.19 PM</p> <p>8.19 PM</p> <p>No</p>	<p>Today</p> <p>ลรุปกรณ์ของผู้ใช้:</p> <p>ผู้ใช้</p> <ul style="list-style-type: none"> - เผ่าพันธุ์ อายุไม่เกิน 15 ปี <p>รายละเอียดความผิด</p> <ul style="list-style-type: none"> - เหตุเกิดขึ้นครั้งเดียวในเวลาลางคืนในห้องนอนของชื่อ... ผู้กระทำความผิดให้มีบุคคลเข้าไปในบ้านและชี้ไฟเบื้องหน้าของชื่อ... หลังจากนั้นผู้กระทำความผิดได้เข้าไปในห้องพ่อของชื่อและขโมยโทรศัพท์มือถือไป 20,000 บาท - มีการคุกคาม - มีการบังคับด้วยอาวุธมีคมแหลมใหญ่ ด้วยมีดในมือ ผู้กระทำความผิดบุกรุกเข้าไปห้องนอนของชื่อ เหตุการณ์ของชื่อเป็นภัยเงียบซ่อนอยู่ที่ห้องนอนของชื่อ เหตุการณ์ของชื่อเป็นภัยเงียบซ่อนอยู่ที่ห้องนอนของชื่อ ลักษณะเป็นคนแปลกหน้าไม่รู้ตัวที่เข้ามาหลับนอนที่ห้องนอนของชื่อ <p>ผู้กระทำความผิด</p> <ul style="list-style-type: none"> - เผ่าพันธุ์ คนแปดริ้ว <p>คุณต้องการให้เขียนข้อมูลเพิ่มเติมกับหัวเรื่องไม่? หรือ คุณสามารถพิมพ์ "ซ้อมใจใหม่" หากคุณต้องการเริ่มต้นใหม่อีกครั้ง และจะลบข้อมูลทั้งหมดที่คุณส่งไปและเริ่มต้นการสนทนากับหัวเรื่องใหม่อีกครั้ง</p> <p>8.19 PM</p> <p>ไม่ต้อง</p>
<p>Here you go! These are the top three most similar Supreme Court decisions to your case, in order.</p> <hr/> <p>Supreme Court Decision #1</p> <p>1) The Supreme Court rules that the defendant's actions are an offense of rape of a child under fifteen years of age using a weapon according to Section 277 of the Criminal Code, paragraph four. This is the provision with the heaviest punishment</p> <p>(Even though the defendant placed the knife on the victim's bedroom floor, it was still near his hands and could be picked up immediately. Consequently, this would arouse fear in the victim as she would believe that she could be attacked with the knife if she resisted the defendant. Therefore, this indicates that the defendant used a weapon to coerce the victim - aligning with the defendant's prior confession.)</p> <p>2) Apart from Section 277, the Supreme Court also upheld lower courts' verdict. The defendant is charged with Sections 335 (7) (8) paragraph two, 364, and 365 (1) (2) (3) in conjunction with Sections 362, 37 of the Criminal Code, for the offense of trespassing into property by carrying a weapon and at nighttime. The offense is a single count against many provisions of the law.</p> <p>3) Sentence: the defendant will be imprisoned for 27 years and 8 months, must return to the first victim a total of 20,000 THB, and will be fined 500 baht.</p> <p>Click here to go to the official Supreme Court decision for further information!</p> <hr/> <p>Keywords Defendant (n)- the person or entity being sued or accused in court.</p> <p>Please know that I am always here for you and that I am always rooting for you every step of the way! If you want to start again, you can also type "reset" and I will forget all the information you sent and restart the conversation all over again.</p>	<p>Read 8.20 PM</p> <p>8.20 PM</p> <p>ได้แล้ว! นี่คืออันดับต้นสุดยอดศาลฎีกาที่ค้าข้อกับการเมืองของคุณมาหากลุ่มคนที่สูง尚นั่นบ่น</p> <hr/> <p>คดีพิพากษาศาลฎีกา</p> <ol style="list-style-type: none"> 1) การกระทำของจำเลยเป็นความผิดฐานท่านบุก抢入ห้องนอนของชื่อที่ 2 โดยใช้อาวุธ ตามประมวลกฎหมายวิธีแพนดานาชาติ 277 วรรคสี่ ซึ่งเป็นกฎหมายบทที่ให้โทษมากที่สุด (จำเลยพยายามอวดว่าตัวเองบุกรุกเข้าไปในห้องนอนของชื่อที่ 2 ในห้องนอน โดยขณะพยายามท้าเข้ามายังห้องนอนของชื่อที่ 2 ช่วงเป็นเวลากลางคืน พร้อมที่จะหักอกหักใจให้ต้นที่ 2 ถูกตัดก่อตัวด้วยอาวุธมีดที่หัน刃เข้าไปในห้องนอนของชื่อที่ 2 ซึ่งเป็นผลก่อให้เกิดความกลัวร้าวโกรธก่อให้ร้ายต่อตัวของชื่อที่ 2 ตามที่จำเลยได้รับคำฟ้องในคดีนี้ จึงมีความผิดตามประมวลกฎหมายอาญา มาตรา 277 วรรคสี่, 335 (7) (8) วรรคสอง, 364, 365 (1) (2) (3) ประกอบมาตรา 362, 371 2) สำหรับความผิดฐานที่คุณบุกรุก抢入ห้องนอนของชื่อที่ 2 โดยมีอาวุธ และในเวลาค่ำคืนให้ต้องหุ้ยหุ้ยร้อนเป็นบางแหง จำเลยจำเลยต้องเสียเงิน 20,000 บาทแก่ผู้เสียหายที่ 2 และปรับ 500 บาท 3) สำหรับความผิดฐานที่คุณบุกรุก抢入ห้องนอนของชื่อที่ 2 โดยมีอาวุธ และในเวลาค่ำคืนให้ต้องหุ้ยหุ้ยร้อนเป็นบางแหง จำเลยจำเลยต้องเสียเงิน 20,000 บาทแก่ผู้เสียหายที่ 2 และปรับ 500 บาท <p>คดีพิพากษาที่ดูเหมือนจะมีความผิดตามของคดีที่คุณฟ้องมา</p> <hr/> <p>คำสำคัญ: จำเลย - บุคคลที่ร่วมก่อเหตุท่องเที่ยวคดีโดยข้อกล่าวหาไว้กับผู้กระทำความผิด</p> <p>โปรดทราบว่าฉันอ่านคู่มือเพื่อคุณและจะเป็นก้าวแรกให้คุณในทุกห้องครอบฯ หากคุณต้องการเริ่มต้นใหม่อีกครั้ง คุณสามารถพิมพ์ "ซ้อมใจใหม่" และจะลบข้อมูลทั้งหมดที่คุณส่งไปและเริ่มต้นการสนทนาใหม่อีกครั้ง</p> <p>Read 8.20 PM</p>

FIGURE 4. Example of LAW-U's legal guidance including TOP-1 Supreme Court case match and its English translation.

algorithm found an exact match between the user's message, a rewrite of 6905/2562, and the abbreviated version of 6905/2562 trained in LAW-U. Additionally, LAW-U's message would include a link to go to the official Supreme Court case in the DEKA website. Lastly, LAW-U would offer definitions of the legal terms used in its messages. This is to make it easier for the user to understand the prior material. Fig. 4 presents how LAW-U delivers these results to the user in a systematic and comprehensible manner.

D. THE SIMILARITY SCORE CALCULATIONS FOR LAW-U'S NLP PIPELINES

To select the best matching Supreme Court cases, the spaCy similarity score, the percentage of common keywords, and the percentage of common keywords' synonyms need to be calculated between the 675 Supreme Court cases and the

targeted Supreme Court cases. The steps in the calculations are as follows:

- 1) All 675 Supreme Court cases in our initial database and data on the targeted 182 Supreme Court Cases, including short, long, and legal experts' versions, are converted into word embeddings to calculate the Cosine Similarity (spaCy similarity score). The targeted 182 Supreme Court cases were chosen out of 675 Supreme Court cases by legal experts to train LAW-U.
 - 2) The spaCy similarity score is calculated between all Supreme Court cases in our initial database and the targeted Supreme Court cases.
 - 3) TF×IDF is used to search for and calculate the percentage of common keywords between all Supreme Court cases in our initial database and the targeted Supreme

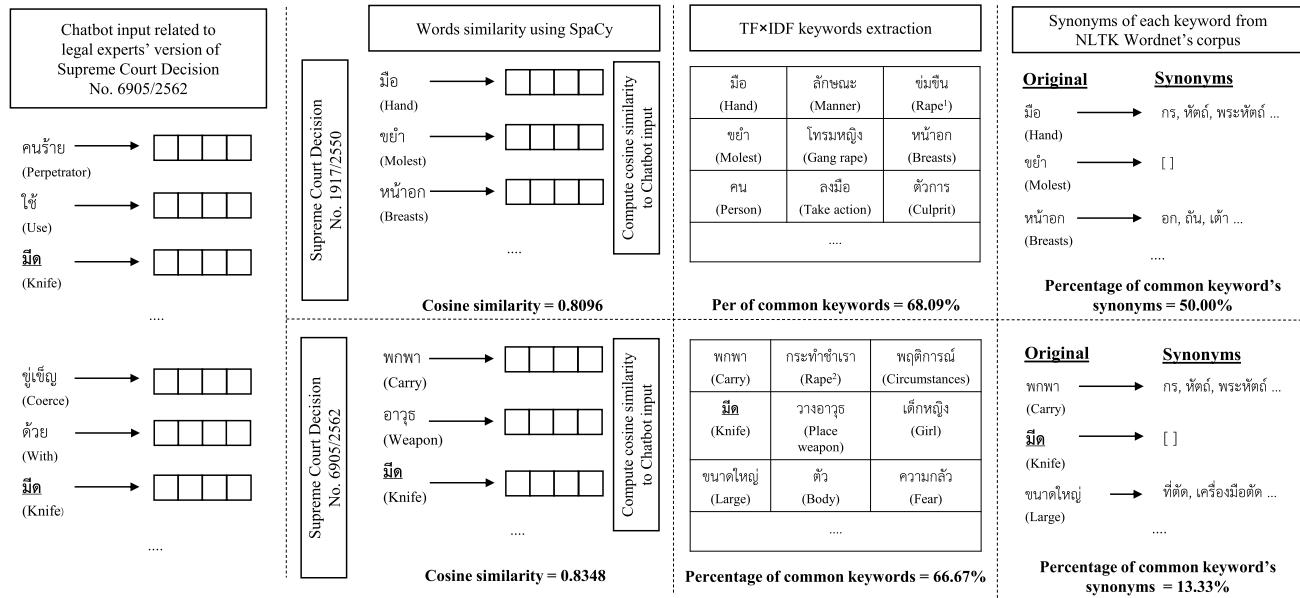


FIGURE 5. Example for LAW-U's NLP pipelines. From left to right, the first is the chatbot input for comparing to all 652×2 Supreme Court cases. The second shows spaCy similarity calculations for common keywords between Supreme Court case pairs. The third shows extraction of keywords by TF×IDF and the fourth shows the search for keyword's synonyms by NLTK's Wordnet corpus.

- Court cases. Significant keywords are extracted in the process while syncategorematic words are filtered out.
- 4) Wordnet corpus is used to search for all possible synonyms of the common keywords found through TF×IDF. The percentage of common keywords' synonyms is calculated between all Supreme Court cases in our initial database and the targeted Supreme Court cases.
 - 5) The spaCy similarity score, percentage of common keywords, and percentage of common keywords' synonyms are used to calculate the mean for every pair of Supreme Court cases as in Fig. 5 (from the targeted Supreme Court case group and the total Supreme Court case group, consisting of 652×2 pairs). These scores are labeled as the NLP pipeline mean average scores.
 - 6) The NLP pipeline mean scores are ranked in ascending order to determine the TOP-1 and TOP-3 rankings. In real-life application, as an AI, LAW-U would use these scores to find the most optimal and similar Supreme Court cases by weighting the spaCy similarity score, the percentage of common keywords, and the percentage of common keywords' synonym.

VI. EXPERIMENTAL RESULTS

This section discusses the results of assessing the model's performance through the evaluation of the testing dataset. This is completed by evaluating the similarity score from spaCy and finding the common keywords and their synonyms to analyze the sequence of corresponding Supreme Court cases. The evaluation of the testing dataset was to ascertain

how well they matched before implementing the model to our LAW-U chatbot.

A. PERFORMANCE FROM STRATIFIED 5-FOLD CROSS VALIDATION

In this study, we compared the rankings of three models: 1) a model ranked with the similarity score from word embeddings (**SIM**), 2) a model ranked with the similarity score from word embeddings and the percentage of common keywords (**SIM×KEY**), and 3) a model ranked with the similarity score from word embeddings, percentage of common keywords, and percentage of common keywords' synonyms (**SIM×KEY×SYN**). This validation of the model was completed through training with a stratified 5-fold cross-validation.

The results of the training through **SIM** are as shown in Table 5. After measuring the similarity score of a total of 675 Supreme Court decisions and arranging the similarity score in descending order (highest percentage to lowest percentage), the results showed **SIM** was able to get an exact match (TOP-1) when matched with legal experts' mock-up input of the Supreme Court cases. For the model trained with only the similarity score of the two data sources, the results of the exact matches were equal to an average of 29.09% of the total Supreme Court cases. Furthermore, for matches in the first to third rankings (TOP-3), the model matched an average of 39.39% of the total Supreme Court cases. The highest performance results for TOP-1 was 33.33% from the 1st and 4th folds, while the highest performance results for TOP-3 was 45.45% from the 2nd and 3rd folds.

TABLE 5. Performance of the three models in the 5-fold cross validation, including the similarity score from the exact match between legal experts' input and Supreme Court decisions (TOP-1), and the exact match within the top three items (TOP-3) between legal experts' input and Supreme Court decisions.

Model	Fold	TOP-3	TOP-1
SIM	1	39.39%	33.33%
	2	45.45%	30.30%
	3	45.45%	27.27%
	4	39.39%	33.33%
	5	27.27%	21.21%
Average		39.39%	29.09%
SIM×KEY	1	72.73%	60.61%
	2	81.82%	78.79%
	3	72.73%	60.61%
	4	78.79%	78.79%
	5	69.70%	60.61%
Average		75.15%	67.88%
SIM×KEY×SYN	1	72.73%	66.67%
	2	81.81%	75.76%
	3	78.79%	72.73%
	4	81.82%	81.82%
	5	75.76%	72.73%
Average		78.18%	73.94%

Thus, this shows that a similarity score or **SIM** alone has low accuracy in finding Supreme Court cases with a TOP-1 or TOP-3 match. Further analysis was then performed to measure the **SIM×KEY**. The **SIM×KEY** model can match an average of 69.09% of the total Supreme Court cases in the TOP-1 rank, with a highest performance of 69.70% for the 2nd and 4th folds. Moreover, a match found in the TOP-3 is equal to an average of 75.15% of the total Supreme Court cases. The highest performance is 81.82% and is from the 2nd fold.

While this showed promising results, we believed that we could further increase the accuracy of the matches. Hence, by adding the keywords' synonyms or **SIM×KEY×SYN**, the model was able to find a match in the TOP-3 for 78.18% of the total Supreme Court cases. The model gave the highest performance of 81.82% for the 2nd and 4th fold. It also matched up 73.94% to TOP-1, with the highest performance of 81.82% for the 4th fold. Since the 2nd fold gave the best results of all the folds by having the highest performance for TOP-1, the model trained by the 2nd fold-based dataset was selected to test its performance for real-world applications.

B. EVALUATION OF HOLD-OUT TESTING DATASET

The results show that the **SIM** model was able to create an exact match or TOP-1 for only 17.65% of accuracy, while TOP-3 has an accuracy of 35.29%. Moreover, by adding **KEY** to find the percentage of common keywords, the model was able to increase the accuracy of matching in the TOP-1 and TOP-3 from 17.65% to 64.71% and 35.29% to 70.59%, respectively. Nevertheless, when considered with the percentage of common keywords' synonyms or **SIM×KEY×SYN**, the accuracy of both TOP-1 and TOP-3 increased to 88.24% – representing 15 out of 17 Supreme Court decisions that meet all requirements.

Nevertheless, two Supreme Court cases were not ranked in TOP-1 and TOP-3. Supreme Court cases 14254/2555 and 2673/2546 were ranked at 65 and 6, respectively. The TOP-1 rank for the results of 14254/2555 was 2269/2562; both of these Supreme Court cases had judgments relating to Section 277 of the Criminal Code. On the other hand, the TOP-1 rank for the results of 2673/2546 was 1048/2518; 2673/2546's judgment related to Section 277 and 279 of the Criminal Code while 1048/2518's judgment related to Sections 276, 277, 279. This may be from similarities in the contexts of the cases, which are further highlighted by similar keywords.

VII. DISCUSSIONS AND FUTURE DIRECTIONS

Sexual violence is an overwhelming and chronic international occurrence that is yet to be resolved. Moreover, the COVID-19 pandemic and the implementation of lockdowns worldwide have compounded sexual violence, especially domestic violence. Calls for prevention programs during the period have been increasingly profound [46]. A cohort of academics examined sexual harassment and sexual assault in Thailand, particularly through the lens of Thai culture and norms and in response to sexual harassment and sexual assault laws in Thailand. Cultural underpinnings of conservatism, patriarchy and power hierarchies, and heteronormativity in Thailand largely cultivates biased responses towards sexual abuse and sexual harassment. The stigmatized nature of sexual violence in Thailand has forced survivors to accept prejudiced accusations from underlying discriminatory norms when they are never at fault and never responsible for such violations against their sexuality. This perceived stigma in Thai society, along with insufficient support services, fear of retaliation from the perpetrator, and gender stereotypes, are the main reasons why countless victims do not report sexual violence cases. Moreover, the biased perceptions of sexual assault and sexual harassment have often distorted how the Thai public interprets the law. This is made even worse by the complex nature of the law, in part from its technical terminology and its constant amendments.

Our study hopes to alleviate these pain points by creating an easily accessible and sufficient service for all sexual violence survivors that empowers them to break the conservative boundaries of society and take legal action against the offender to ensure there is no retaliation and that their rights are respected. Our study's solution to this issue and our unique contribution to the discourse is in the form of LAW-U. This AI chatbot tailors legal guidance in a manner that is up-to-date and comprehensible to everyone. By providing a private and safe environment for survivors to relay their concerns, survivors – regardless of age and gender – can access accurate and precise legal recommendations and can apply complex Thai law to their situations with no charge. Furthermore, when support networks and services are inaccessible and limited in resources, LAW-U fills in the gaps and acts as an excellent supplement for legal services as the algorithm is based on consultation with legal experts and

Thailand's Supreme Court Decisions for Section 276, 277, 278, and 279 of the Thai Criminal Code. This is all with the aim to perpetuate awareness against sexual violence and to eliminate tolerance against the crimes by supporting victims and survivors in reporting offenses and legally acknowledging these offenses as sexual crimes.

As a chatbot, LAW-U is able to treat all users equally and give non-preferential, unbiased, and accurate legal guidance to users. Developed to be sensitive to private details, LAW-U does not press users in specifying their gender and does not ask for the user's full name or profession – users can retain the same amount of anonymity as searching for answers online but also gain the ability to receive tailored and summarized guidance on their case. LAW-U was developed with the aim for users to have full comfortability with the AI in discussing their case and answering questions to encourage users that sexual crimes are never to be tolerated and rights, in particular regarding sexuality, are always to be respected. For this mindset to propagate and for sexual violence to be diminished, legal action on sexual offenses should occur to establish that Thai law and international human rights law do not condone sexual violence of any kind. This study's creation of LAW-U hopes to set a precedent for other works in the AI and sexual violence support network community in pushing for an alternative system that can assist sexual violence victims and survivors.

Being the first AI chatbot in Thailand and internationally to give legal guidance tailored to sexual violence cases, our training methods through Supreme Court cases are wholly unique and cultivated through thorough considerations by experts in law and AI. However, with this being the study's first model, certain limitations are yet to be resolved. Firstly, the development of the model mainly included the process of directly comparing the similarity score of the user's input and the matching Supreme Court cases through identifying the common keywords. While the addition and utilization of synonyms allow for an increase in accuracy, a more extensive and expanded method of training can increase the precision of the matches.

Moreover, the data our study collected from were the Supreme Court cases. As these are real-life cases that have Supreme Court judgments, the use of this data is vital to our research as we have the details of the case and legal decisions made by the highest judicial institution in the land whose judgments can guide the decisions made by lower courts. Nevertheless, the data we collected is the data that is only available to the public. Whether it be short or long abbreviated versions of the Supreme Court cases, there are certain information left out due to the litigation parties' privacy or information that is just not detailed in the abbreviations. For example, there might be information missing on the victim and plaintiff's gender, their exact age, and whether they have reported the information to the police. This creates gaps in LAW-U training, which may be relieved by training from real-time data or an increase in the input data.

Another limitation to our current model is that it cannot be utilized by users with certain visual or cognitive disabilities. However, as LAW-U hopes to support all sexual violence survivors, this target group will not be neglected. Therefore, an improvement to our current model may include the addition of automatic speech recognition and voice-enabled conversations as inspired by the discussion in Herbert and Kang's study [47].

Furthermore, the data from the Supreme Court included cases that did not have only heteronormative perpetrators and victims. Legal experts also selected cases with these details to ensure that what we trained LAW-U with is a true reflection of reality. The use of the data in training emphasizes that LGBTQ+ relations exist in the sexual violence discourse and should be given as much significance as binary relations in sexual violence. Nevertheless, whether it be due to under-reporting or not specifying gender in case reports, there are not many cases of LGBTQ+ that go beyond the male-male victim-perpetrator relationship. This is a possible limitation to our model as our chatbot should be trained to prepare for all possible message inputs and scenarios when receiving information on sexual violence incidents from the user.

Another limitation that, when resolved, will contribute significantly to our data pool is collecting data from volunteers. Real-life test subjects can add new data to the pool and increase the extensiveness of the situations that LAW-U has been trained with to improve the accuracy of matching with unpredicted, real-life events. Moreover, the data received will be more current than data gathered from past Supreme Courts, which will give information that has updated cultural contexts and include specific characteristics of the changing society. This is integral to the study as the recent amendments in legal provisions would be more accurately tied to the progressed world.

Additionally, another limitation is that LAW-U gives legal guidance by tailoring the top three Supreme Court decisions most similar to the user's case. Due to the nature of AI, LAW-U exists as a supplement to legal experts and is not yet expected to be a replacement for them. However, this does not mean that the chatbot should not be developed in giving more detailed and more accurate legal advice. To do so, LAW-U should be able to expand to advise users in the specific Sections that their offenses relate to so that users can utilize the advice when making the police report, suing the perpetrator, and ensuring that the complaint made is comprehensive. Moreover, LAW-U should also advise users on what rights users have relating to the case and their rights in filing a charge against the perpetrator.

In addition to the future directions of our works mentioned prior by resolving the limitations, we also hope to expand the chatbot to answer in English. As we have designed the chatbot to answer in Thai due to its use in Thailand, the chatbot may not be available for tourists or expatriate and immigrant members of the Thai community. Nonetheless, as our study aims to allow everyone in Thailand to use LAW-U in receiving legal guidance on sexual violence, expanding

to include a universal language like English will allow our chatbot to reach more targeted groups. Acknowledging the severity of sexual violence worldwide and the importance of alleviating this issue, we also hope to advance this project internationally, beyond expanding to include other languages prevalent in Thailand. While challenges may arise in tying differing domestic laws to our chatbot, the unique contribution LAW-U brings by giving legal recommendations as an AI will at least make a lasting impact in curbing sexual violence at the international level. In a similar tangent, to increase access points to LAW-U, future works would include tying the chatbot to a variety of popular messaging platforms. Doing so would increase the usage of the chatbot and multiply the impacts of LAW-U and its objectives to the broader community.

VIII. TRANSLATION OF SECTION 276, 277, 278, AND 279 OF THE THAI CRIMINAL CODE B.E. 2563

A. SECTION 276

Whoever has sexual intercourse with a person without their consent by coercion, an act of violence, in the condition that such person cannot resist, or by making such person mistake the offender for another person, the offender shall be liable to imprisonment from 4 years to 20 years and fined from 80,000 to 400,000 THB.

If the offense, according to the first paragraph, was committed by making such person believe that the offender had firearms or explosives, the offender shall be punished with imprisonment of 7 to 20 years, and fined from 140,000 to 400,000 THB.

If the offense, according to the first paragraph, was committed by carrying or using any firearms or explosive or by participation of persons in the nature of degrading a woman or man in the same manner, the offender shall be punished with imprisonment of 15 to 20 years and fined from 300,000 to 400,000 THB or imprisonment for life.

If the offense, according to the first paragraph, was committed between spouses and the spouses desire to cohabit, the Court may punish by the punishment lighter than that described in the law as it may be considered or the Court may determine some conditions for behavior control instead of punishment. In the case of punishment with imprisonment as according to the judgment provided by the Court and if any of the spouses do not desire to cohabit and desire to divorce, that party shall inform the Court and the Court shall inform the public prosecutor to proceed with suing for divorce for them.

B. SECTION 277

Whoever has sexual intercourse with a child under fifteen years of age who is not his wife or her husband, regardless of the child's consent, the offender shall be liable from 5 years to 20 years of imprisonment and fined from 100,000 to 400,000 THB.

If the offense, according to the first paragraph, has been committed to a child that is not over thirteen years old,

the offender shall be punished with imprisonment from 7 years to 20 years and fined from 100,000 to 400,000 THB, or imprisonment for life.

If the offense, according to the first or second paragraph, was committed by making such person believe that the offender had firearms or explosives, the offender shall be punished with imprisonment of 10 to 20 years, and fined from 200,000 to 400,000 THB, or imprisonment for life.

If the offense, according to the first or second paragraph, was committed by carrying firearms or explosives, or by using arms, or by participation of persons in the nature of degrading a girl or a boy, in the same manner, the offender shall be punished with imprisonment for life.

If the offense, according to the first paragraph, has been committed by an offender who is not over eighteen years old and commits against a child who is over thirteen years old but not over fifteen years old, and by consent of the child, the Court with a jurisdiction over juvenile and family cases can consider protection of the victim or the offender under the law concerning child protection. The Court must take into account the victim and offender's age, past record, behavior, level of intelligence, education and training, health, mental state, occupation, and environment surrounding both parties. The Court also must take into account the relationship between the offender and the victim, and any other reasonable causes that can be of benefit to the victim.

In the case where the victim or offender's welfare is protected under the law concerning child protection, the offender will not be punished. However, if such welfare protection is not successful, the Court may punish the offender any less than the law stipulates for such offense. In the Court's consideration of the judgment, the Court should take into account the facts under paragraph five.

Section 277 bis,- If the commission of the offense according to the first paragraph of Section 276, or the first or second paragraph of Section 277, causes:

- 1) Grievous bodily harm to the victim, the offender shall be punished with imprisonment of 15 to 20 years and fined 300,000 to 40,000 THB, or imprisonment for life;
- 2) Death to the victim, the offender shall be punished with death or imprisonment for life.

Section 277 ter.- If the commission of the offense according to the third paragraph of Section 276 or the fourth paragraph of Section 277, causes:

- 1) Grievous bodily harm to the victim, the offender shall be punished with death or imprisonment for life;
- 2) Death to the victim, the offender shall be punished with death.

C. SECTION 278

Whoever commits an indecent act against a person over fifteen years of age through any act of violence, by taking advantage of the person who has no inability to resist through violence, or by causing the person to misunderstand the offender for another person, shall be punished with

imprisonment not exceeding 10 years or fined not exceeding 20,000 THB, or both.

If the offense, according to the first paragraph, is an act that involves the use of an object or an organ other than the sexual organs to invade such person's sexual organs or anus, the offender shall be punished with imprisonment of 4 to 20 years and fined from 80,000 to 400,000 THB.

If the offense, according to the second paragraph, was committed by making such person believe that the offender had firearms or explosives, the offender shall be punished with imprisonment of 7 to 20 years, and fined from 140,000 to 400,000 THB.

If the offense, according to the first or second paragraph, was committed by carrying firearms or explosives, or by using arms, or by participation of persons in the nature of degrading a girl or a boy, in the same manner, the offender shall be punished with imprisonment of 15 to 20 years and fined from 300,000 to 400,000 THB, or imprisonment for life.

D. SECTION 279

Whoever commits an indecent act against a child not yet over 15 years of age, whether such child has given consent or not, the offender shall be punished with imprisonment not exceeding 10 years or fined not exceeding 200,000 THB, or both.

If the offense, according to the first paragraph, is an act against a child under thirteen years of age, the offender shall be punished with imprisonment of 1 to 10 years or fined from 20,000 to 200,000 THB, or both.

If the offense, according to the first or second paragraph, is committed by any coercion, any act of violence, taking advantage of a child who is in a condition of inability to resist, or by causing the child to misunderstand the offender for another person, the offender shall be punished with imprisonment of 1 to 15 years or fined from 20,000 to 300,000 THB, or both.

If the offense, according to the first or third paragraph, is an act that involves the use of an object or an organ other than the sexual organs to invade the child's sexual organs or anus, the offender shall be punished with imprisonment of 5 to 20 years and fined from 100,000 to 400,000 THB.

If the offense, according to the fourth paragraph, is an act against a child under thirteen years of age, the offender shall be punished with imprisonment of 7 to 20 years and fined from 140,000 to 400,000 THB, or life imprisonment.

If the offense, according to the fourth or fifth paragraph, was committed by making the child believe that the offender had firearms or explosives, the offender shall be punished with imprisonment of 10 to 20 years, and fined from 200,000 to 400,000 THB, or life imprisonment.

If the offense, according to the first or second paragraph, was committed by carrying firearms or explosives, or by using arms, or by participation of persons in the nature of degrading a girl or a boy, in the same manner, the offender shall be punished with imprisonment for life.

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