AIoT Invigorates Smart City
Smart City Summit & Expo
Mar. 24 Tue ~27 Fri, 2020
Taipei Nangang Exhibition Center Hall 2
Concurrent Events
SMART EDUCATION EXPO
SHE TAIPEI
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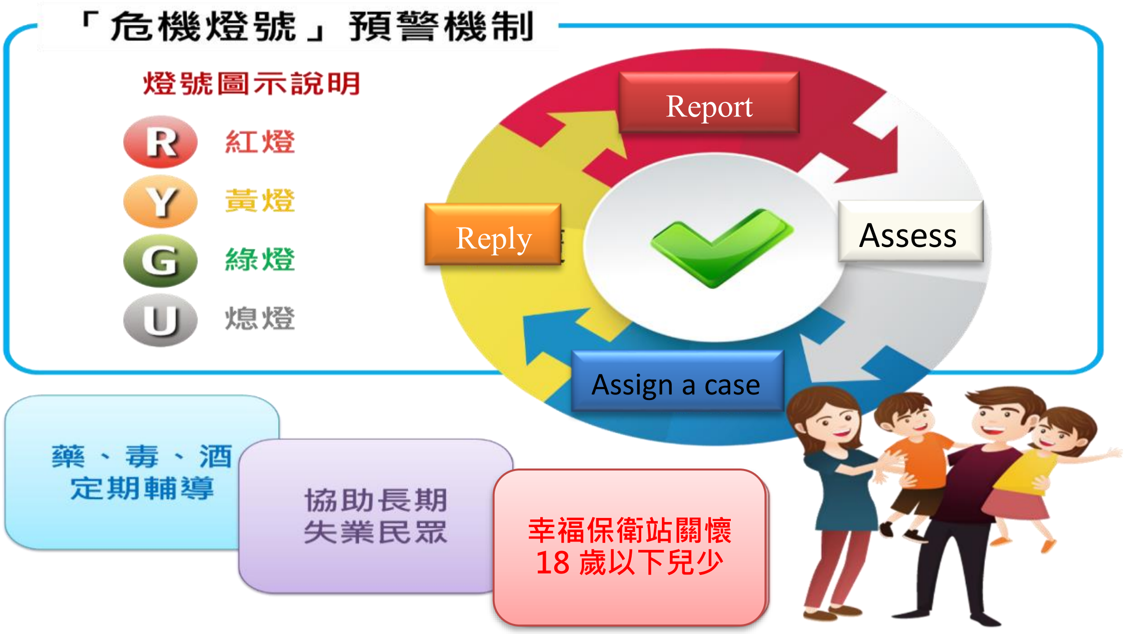
iTS Expo

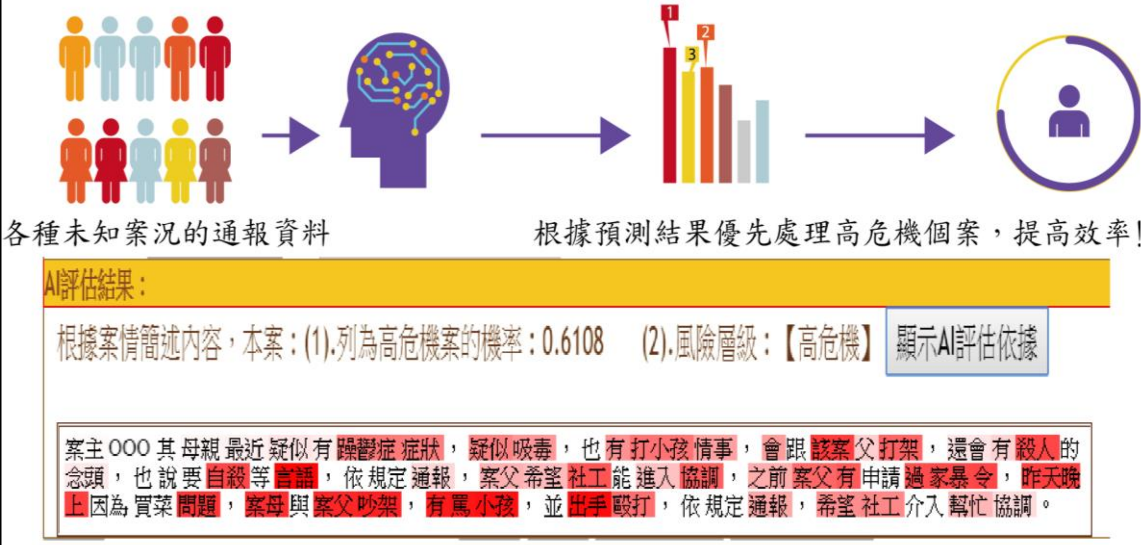
2020 Award of system integration for Smart City

Award-winning application brief

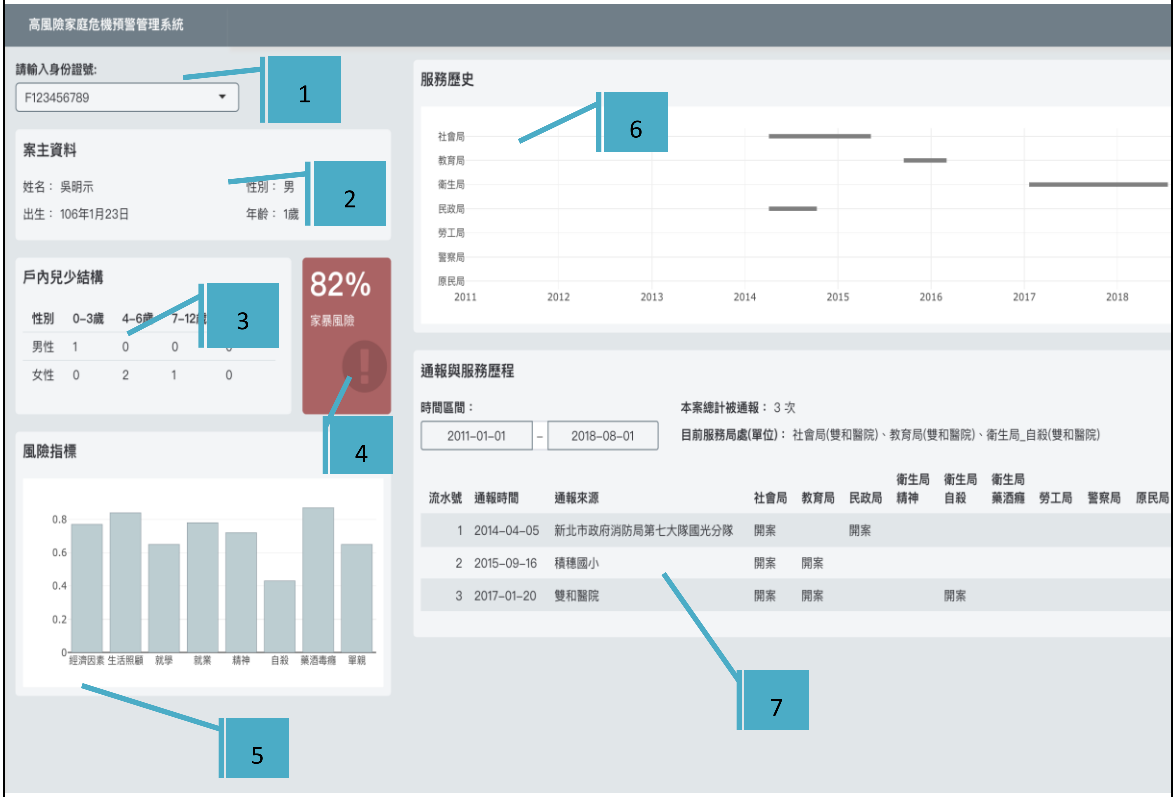
Name of Unit	Social Welfare Department, New Taipei City Government	**Hyperlink**	
Name of Application Service	Integrated Safety Network for High-Risk Families in New Taipei City: Information Management and Crisis Early-Warning Systems		
Name of the Collaborative Group		**Hyperlink**	
Brief of the Application or Service	(300WORDS) In 2011, New Taipei City introduced the Integrated Safety Network Service Plan for High-Risk Family project, Taiwan's first-ever project gathering resources across departments and adopting various intervention measures to help children from high-risk families. Previously, social affair departments worked alone to solve such problems. This change facilitated the early detection of high-risk families facing difficulty or who needed help to prevent and reduce the harm caused by risk factors on children. To effectively access interdepartmental service information on individual cases and induce network information integration, the following system functions were developed for this project: 1. High-risk family information management system and its functions (working partner: WeZoomtek Corp.) (1) Integrated public and private reporting system (2) Diversified case assignments across departments (3) Integrated services and service history (4) Service performance assessments and management (5) Risk signal management (6) Social worker case screening, case assignment, and AI-based interview risk assessments 2. Crisis early-warning and management system for high-risk families (working partner: DSP, Inc.) In 2018, New Taipei City's High-Risk Families Services Management Center implemented the Crisis Early-Warning and Management System project for high-risk		

	families and incorporated 1.47 million pieces of data from this system into Taiwan's first-ever scientific governance-assisted social welfare service model to develop risk calculators and employ AI to develop high-risk prevention and performance dashboards, hot zone maps, and an individual case risk-related early-warning management system to enable frontline service staff to make immediate risk judgments and identify family crises early.  「危機燈號」預警機制 燈號圖示說明 R 紅燈 Y 黃燈 G 綠燈 U 熄燈 Report Assess Assign a case Reply 藥、毒、酒 定期輔導 協助長期 失業民眾 幸福保衛站關懷 18 歲以下兒少 **Fig. 1 The "crisis signal" early warning mechanism** **Note:** This system features "report," "assess," "assign a case," and "reply" functions by using light signals to display services and risk statuses from each department, which enables it to determine and be up-to-date on the service situations of cases. Light signal description ： R > Red 、 Y>Yellow 、G > Green 、U> no lights
Brief of Innovation Initial and Achievement	(300WORDS) This application system combines services provided by a network comprising units such as the Social Welfare Department, Department of Health, Education Department, Labor Affairs Department, Department of Civil Affairs, Police Department, Indigenous Peoples Department, and Youth Counseling Committee and establishes interdepartmental case management procedures such as reporting, assessing, assigning cases, providing services, and testing. The departments' collective wisdom and efforts have helped 117,506 young children from high-risk families over the past 7 years and protected 87.49% of families served from experiencing another crisis. Family crises have been prevented in a timely manner and better services have been provided to citizens.

	Where/what is the application system used (for)? (1) The application system is used by case management personnel in the departments to type records, by case assigners in the said high-risk center to screen cases, by social workers to assess case visit frequency and manage cases, and by supervisors and managers to evaluate performance or policies. (2) Big data analyses are used to draw hot zone maps of high-risk cases in New Taipei City, build dynamic information dashboards for high risk cases in New Taipei City, and set up multilevel filtering functions to enable users to perform searches by entering search criteria such as type, gender, age, risk index, and region. In addition, computer calculations can be performed to present statistical or distribution results, which can help managers and policy planners explore the distribution and trends of high-risk crisis families in New Taipei City from a macro-perspective and introduce service policies for contingency plans accordingly.
Challenges and Solutions for the Application Deployment	(200WORDS) (1) High-risk family information management system During the early stage of introducing the high-risk family information management system, finding a balance between policy direction, department professionalism, and rational informatization was difficult. By practicing effective interdepartmental communication; engaging in interdepartmental meetings; accumulating cooperation experience; designing, developing, generalizing, unifying, and simplifying the management system for users and policymakers; establishing an integrated and tailor-made system architecture; and incorporating AI technology into the management system, user experience and operation efficiency were enhanced. (2) High-risk family crisis early-warning and management system The high-risk family crisis early-warning and management system has been used for many years. However, because professional and frontline workers across departments enter service data records into the system differently, the quality of records was inconsistent. Therefore, a considerable manpower and time had to be invested during the early stage of the project to modify the data. In addition, to ensure information security, personal information confidentiality, and no data omission, the Social Welfare Department of the New Taipei City Government developed an offline risk calculator that provides early-risk warnings by using data from historical databases and controls account authorization. The calculator can be connected online and used by social workers to effectively judge risks.

Innovation Index	(100WORDS) 1. This is Taiwan's only interdepartmental case assigning procedure, which evolved from the service model of social affair departments working alone to handle high-risk and vulnerable family matters. 2. AI is incorporated into traditional social work case management. 3. An early warning system was built using big data to help social workers handle related matters promptly and plan policies accordingly.  1 2 3 各種未知案況的通報資料 根據預測結果優先處理高危機個案，提高效率! 顯示AI評估依據 AI評估結果： 根據案情簡述內容，本案：(1).列為高危機案的機率：0.6108 (2).風險層級：【高危機】 案主OOO其母親最近疑似有躁鬱症症狀，疑似吸毒，也有打小孩情事，會跟該案父打架，還會有殺人的念頭，也說要自殺等言語，依規定通報，案父希望社工能進入協調，之前案父有申請過家暴令，昨天晚上因為買菜問題，案母與案父吵架，有罵小孩，並出手毆打，依規定通報，希望社工介入幫忙協調。 Fig. 2 AI assessment results and criteria According to the brief description of the case received, (1) this case has a probability of 0.6108 of becoming a high-risk case, and (2) its risk level iso【 high 】 This case subject OOO's mother was recently suspected as having bipolar disorder and engaging in drug abuse, has beat her child and fought with her husband, has demonstrated consideration of killing people, and has expressed suicidal thoughts. This situation was reported to the New Taipei City government according to relevant regulations. The case subject's father, who applied for a protection order, wished for social workers to be involved in handling the situation. Last night, because of a grocery shopping dispute, the case subject's mother argued with her husband and scolded and beat her child. Thus, the situation was reported to the New Taipei City Government according to relevant regulations, and the case subject's father wishes that social workers be involved to handle the situation. **Note:** By integrating the attention mechanism, optimizing model accuracy, and adopting

a visual method, users can see the prediction results offered by the model, thereby trusting its results. Report information on the status of various unknown cases → Process high-risk cases predicted as high priority → improved efficiency!



高風險家庭危機預警管理系統

請輸入身份證號:
F123456789

案主資料
姓名： 吳明示　性別： 男
出生： 106年1月23日　年齡： 1歲

戶內兒少結構

性別	0-3歲	4-6歲	7-12歲	
男性	1	0	0	0
女性	0	2	1	0

82%
家暴風險

通報與服務歷程
時間區間：
2011-01-01 – 2018-08-01
本案總計被通報： 3 次
目前服務局處(單位)： 社會局(雙和醫院)、教育局(雙和醫院)、衛生局_自殺(雙和醫院)

流水號	通報時間	通報來源	社會局	教育局	民政局	衛生局 精神	衛生局 自殺	衛生局 藥酒癮	勞工局	警察局	原民局
1	2014-04-05	新北市政府消防局第七大隊國光分隊	開案		開案						
2	2015-09-16	積穗國小	開案	開案							
3	2017-01-20	雙和醫院	開案	開案			開案				

Fig. 3 **Diagram of the high-risk family crisis early-warning and management system**

1. Please enter your national identification card number
2 .Subject information (name, gender, date of birth, and age)
3 Young children in the household (genders and age range)
4 Risk score
5 Risk indicator
6 Service history
7 Report and service history

Note: Actual data are supported by quantified and historical case data to predict family crises

Future Plan

(100WORDS)

1. AI automatically makes case assignment recommendations, which simplifies the case-assigning process

2. The information management system is constantly optimized and indirectly integrated

into central vulnerable family systems

3. Safety network services are elevated using big data analyses, which benefits vulnerable groups

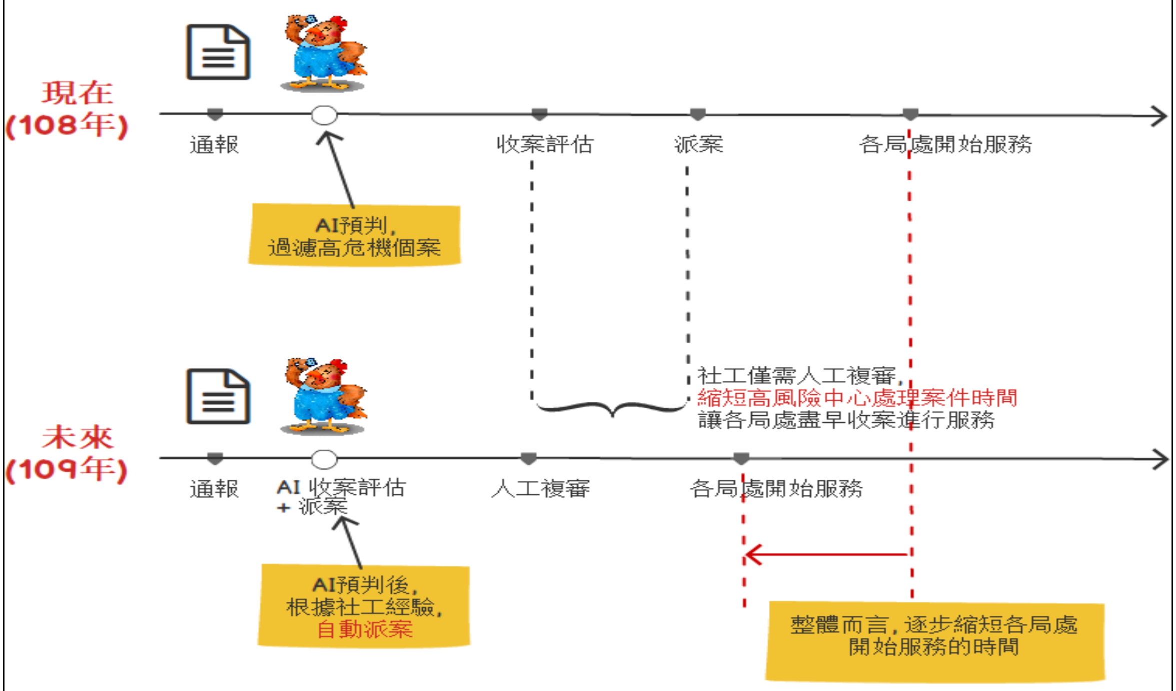

現在
(108年)
通報
收案評估
派案
各局處開始服務
AI預判，
過濾高危機個案
社工僅需人工複審，
縮短高風險中心處理案件時間
讓各局處盡早收案進行服務
未來
(109年)
通報
AI 收案評估
+ 派案
人工複審
各局處開始服務
AI預判後，
根據社工經驗，
自動派案
整體而言，逐步縮短各局處
開始服務的時間

Fig. 4 **Present to Future**

Note:

Present Report made > AI uses prediction to filter for high-risk cases > case is assessed > case is assigned > each department begins to offer services

Future Report is made > AI makes prediction and automatically assign cases according to social worker’s experience > a personnel reviews case > each department begins to offer services (Overall, the service can be more promptly provided)

AI completes report forms and makes appropriate case assignment suggestions for cases it deems should be opened, after which case assigners working in the high-risk management center perform reviews. If cases are valid, they are immediately forwarded to responsible departments, which substantially decreases time from case reporting to service offering.