Over the last decade, executive power grabs, also called executive aggrandisement, have driven a retreat of democracy raising concerns about Europe's democratic resilience among scholars, policymakers and the public alike. Despite the profusion of data on many dimensions of democratic life, democracy researchers have not been able to identify the multidimensional causal pathways that trigger executive aggrandisement and weaken rule of law-based institutions. Methods traditionally used in democracy research simply cannot provide a comprehensive understanding of the complex and multidimensional causes of executive aggrandisement. TWIN4DEM ambitions to scale up the use of Computational Social Sciences (CSS) in democracy research by bringing together scholars of Social Sciences and Humanities (SSH), CSS, computer scientists and democratic promotion stakeholders to jointly address one of the most crucial questions in democracy scholarship: what causes democracies to decline? Combining various advanced CSS methods (natural language processing; data aggregation and synthesising, and dynamic simulation models) allows to uncover the drivers and implications of executive aggrandisement in a more precise manner. By prototyping the first ever digital twins (DT) of four European democratic systems (Czechia, France, Hungary and the Netherlands), TWIN4DEM develops cross-cutting tools to process and aggregate textual and non-textual data more efficiently and accurately through the simulation of policy scenarios in a participatory and inclusive environment.

Using traditional research methods (eg: statistical regression techniques, quantitative case studies), scholars have successfully identified multiple socio-economic and institutional correlates of democratic backslide but fail to determine which combinations of actors, behaviours and critical events trigger a process of democratic erosion. To address this gap, TWIN4DEM advances the application of CSS in democracy research by co-designing, with democracy stakeholders, the first ever digital twin (DT) of political systems. DT are precise virtual copies of real-world systems that demonstrated significant advancements in optimising production processes, improving product quality and enhancing customer satisfaction in Industry 4.0. More recently, applications in healthcare have enabled personalised and enhanced diagnostic and care services4. TWIN4DEM aims to bring such potential to the study of democratic resilience. DT technology uniquely allows to explain executive aggrandisement in two ways. First, it enables the simulation of non-linear and complex decision-making processes that lead to the concentration of powers in the executive. Second, by using a combination of CSS methods, DTs aggregate and synthesise different types of data (socio-economic, legal, political) in an efficient and regular manner, ensuring fidelity between the real-life systems and its digital replicate. Consequently, the DT technology promises to capture the dynamic and multidimensional causes of executive aggrandisement more accurately than traditional methods in democracy research. To achieve this overall ambition within 36 months, TWIN4DEM has articulated four core objectives:

- Generate, after 32 months, a new agent-based conceptual framework of executive aggrandisement allowing the systematic identification and testing of causal pathways to executive aggrandisement.
- Prototype - over 26 months and with national policymakers and civil society organisations (CSOs) - four DT of political systems (Czechia, France, Hungary and the Netherlands) integrating various sources of high-quality data and allowing the simulation of policy scenarios in a participatory and inclusive fashion.
- Pilot over 32 months new cross-cutting SSH and CSS tools allowing the processing, synthesising and aggregation of various types of textual and non-textual data in real-time in a FAIR and GDPR-compliant manner.
- Formulate after 36 months recommendations and guidelines on how to scale up the use of CSS in democracy research in an ethical, open and inclusive manner. TWIN4DEM will advance the

use of CSS methods into the study of democratic resilience through the setup of an open-source community of stakeholders gathering SSH, CSS scholars and democracy stakeholders abiding to transparency, inclusiveness, ethics-driven and fair use of technology.

TWIN4DEM will enhance and modernise democratic governance in Europe by creating the first DT prototypes of four European political systems. At the societal level, this will allow the identification of institutional reforms to prevent or reverse executive aggrandisement through the participatory testing of policy scenarios with policymakers and civil society organisations. At the scientific level, TWIN4DEM will advance the use of CSS in democracy research through the release of cross-cutting tools to process, aggregate, synthesise, and update various types of data and the adaptation of state-of-the-art simulation models to the study of democratic decision-making.

TWIN4DEM brings together 11 partners across Europe, including Université Catholique de Lille (France), GESIS Leibniz Institute for the Social Sciences (Germany), Fundazione Bruno Kessler (Italy), Linnaeus University (Sweden), Babeş-Bolyai University (Romania), Társadalomtudományi Kutatóközpont (Hungary), Charles University (Czechia), Eticas Research and Consulting (Spain), Democracy International (Germany), and Diadikasia Business Consulting (Greece). These institutions will collaborate to develop advanced tools for processing and analysing both textual and non-textual data in a more inclusive, participatory research environment.

For more information about the project, visit https://twin4dem.eu/