

Building Permitting – a socio-technical phenomenon

Postdoc study

Context and Research objective

The issuance of building permits holds a crucial role in the construction industry, representing the authority of local administrations to enforce legal measures governing the location, design, execution, and operation of construction projects. The primary objective is to ensure the safety, sustainability, and adherence of buildings to local regulations. However, current building permit systems, predominantly reliant on traditional documents and processes, face limitations that impede efficiency and transparency. The integration of digitalization, involving the utilization of digital data and tools to support or automate verification processes, has the potential to overcome these challenges and enhance the overall permitting process.

Despite the promising advantages of digitalization and the substantial transformation of the construction sector through digital technologies, the building permitting process remains a formidable and under-researched topic. The complexity arises from the fact that the building permit system involves stakeholders from diverse sectors, including the public sector, and encompasses governance aspects. Therefore, achieving a successful digital transformation extends beyond merely developing tools for digital delivery; it requires a comprehensive understanding of the intricate challenges involved.

Canada has established itself as a pioneer in this field (both in research and in practice) and the project will explore in depth the reasons, progress and impact of this digitalisation on building permit processes in Canada. A comparison allows for an understanding of the strengths and weaknesses of Canadian practices in a global context and can provide valuable insights for the advancement of building permit processes in other countries, including European nations.

Methods

Prior to the start of the research stay, a thorough analysis of the existing literature on building permit processes and their digitalisation in Canada will be conducted. During the stay in the Canadian province of Ontario, interviews and surveys will be conducted to identify the differences to European systems and to investigate the impact of digitalisation. Experts, officials and other relevant stakeholders will be interviewed to gather their experiences and opinions on the building permit process and its digitalisation. The collected data is then subjected to a qualitative content analysis.

Relevant previous studies

My previous work covers various aspects of digitalisation and process optimisation in the building permit sector, with a focus on global perspectives and innovative solutions. The topic of building permits always forms the core of my work but extends into different areas such as digitalisation and technologies as well as process and organisational management. For example, my previous studies provide insights on process analyses and comparisons in different countries (this includes studies in South Tyrol (Italy), Israel, the USA, and over 20 European countries as illustrated in Figure 1) and the human perspective on building permit processes using Cultural-historical Activity Theory. Furthermore, I have developed process modelling and evaluation methods as well as taxonomies for the organisation of knowledge for the digitalisation of building permit systems. On the technical level, my preliminary work deals, for example, with requirements and frameworks for Gaia-X-based building permit processes, ontology-based workflow models and the improvement of regulations for automated design reviews in the construction sector. Extensive and up-to-date review articles that highlight the imbalance between technology and process studies in the building permit process or the general state of research on digital building permits are also part of my preliminary work. My dissertation work, in which I developed a decision model for determining the eligibility for building permits which systematically identifies and describes the various components of a building permit assessment. Overall, the work represents approaches for the further development and improvement of building permit processes.

Expected results

The planned research stay in Canada will provide added value for science in the field of building permit procedures and their digitalisation. This will be achieved through the possibility of international comparisons and best practices, knowledge transfer between Canada and Europe, practical insights into the implementation of digitalisation and interdisciplinary perspectives. The expected results will generate valuable insights and recommendations that will enrich the academic community and the construction industry alike to promote more efficient, transparent and citizen-friendly building permit processes.

Stakeholders	Sub entities	Austria	Belgium	Czech Republic	Denmark	Estonia	Finland	France	Germany	Hungary	Italy	Montenegro	North Macedonia	Portugal	Romania	Slovenia	Sweden	United Kingdom	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Building Permit Authority		A	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Plan checker (technical)	B	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Urban planning checker	C	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Clerk (adm. Role in charge)	D	Y	N	Y	N	Y	Y	N	Y	N	Y	Y	Y	N	N	N	N	
	Committee	E	Y	N	N	Y	Y	Y	N	Y	Y	N	N	N	Y	O	Y		
External Experts		F	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Structural	G	Y	N	Y	Y	N	Y	O	Y	Y	Y	Y	N	Y	N	Y	Y	
	Landscape architect	H	N	N	Y	Y	Y	O	N	N	N	N	N	N	Y	Y	Y	Y	
	Architecture/design	I	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	Sewerage/sanitary	J	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	
Neighbors	Engineer	K	Y	N	Y	Y	Y	Y	O	Y	Y	Y	Y	N	Y	N	Y	Y	
	Public	L	Y	Y	Y	Y	Y	N	O	Y	N	N	Y	N	Y	O	Y	N	
Boards		M	Y	Y	Y	Y	Y	Y	O	Y	N	N	N	N	Y	Y	Y	Y	
	Rescue Board/ Health board	N	Y	Y	Y	Y	Y	Y	O	Y	Y	O	N	N	Y	Y	Y	Y	
	Board of town hall	O	Y	N	Y	Y	Y	Y	N	Y	N	O	N	N	Y	Y	Y	Y	
	Planning appeals board	P	N	Y	N	Y	N	N	N	Y	Y	N	N	N	N	N	N	N	
	National board of antiquities	Q	N	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	
Authorities & departments		R	N	Y	Y	N	Y	Y	Y	Y	N	N	N	Y	Y	Y	O		
	City government	S	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	State road office	T	Y	Y	Y	Y	Y	Y	O	Y	Y	N	Y	Y	Y	Y	O	Y	
	Road construction authority	U	N	N	N	N	N	O	Y	N	N	N	N	N	Y	Y	O	Y	
	Nature conservation authority	V	Y	Y	Y	Y	Y	Y	O	Y	N	N	N	N	N	N	Y	O	
	Consumer protection authority	W	Y	Y	Y	Y	Y	Y	O	Y	N	N	N	N	N	N	Y	O	
	Technical Regulatory Authority	X	Y	N	N	Y	N	Y	O	Y	N	Y	N	N	N	N	Y	O	
	Agriculture department	Y	Y	Y	Y	Y	Y	Y	O	Y	N	Y	N	N	N	Y	Y	O	
	National board of antiquities	Z	Y	N	Y	N	N	Y	O	N	N	N	N	N	N	Y	Y	O	
		Z	N	Y	Y	N	Y	Y	O	Y	N	N	N	N	N	Y	Y	O	

Figure 1 – Comparison of stakeholders involved in the building permit process across 17 European countries

Utilisation of the funding

The funding will be used for a three-week research stay in Ontario including visits at the University of Toronto and at different building permit authorities (such as City of Toronto, Town of Whitchurch-Stouffville, City of Kingston und Town of Oakville) and companies (such as AECO Innovation Lab). The visits at the authorities are part of field research including qualitative expert interviews for data collection. In addition, a visit at Laval University, Quebec (Center for Research in Geospatial Data and Intelligence (CRDIG)) is planned.

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