

Towards a Formal Framework for Modeling Patient Journeys

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Abstract. Patients encounter multiple actors across their journeys. Unlike patient pathways, a patient journey reflects the patient perspective and include actors extending beyond single healthcare providers. Since existing approaches to patient journeys remain institution-centric, we propose a categorization of actors based on an empirical study with patients. Our proposed categorization extends beyond traditional healthcare providers to include patient portals and other external entities.

Keywords. Patient journey, formalism, actors, categorization, CJML

1. Introduction

‘Patient pathways’ represent standardized healthcare processes for managing specific conditions. In contrast, a ‘patient journey’ emphasizes the patient’s perspective and may include interactions beyond the healthcare context [1]. Patient journey mapping is increasingly being adopted to understand patient experiences and identify bottlenecks in care delivery. However, formalism for patient journeys remain limited, and existing frameworks often take an institution-centric perspective. The Customer Journey Modeling Language (CJML) has proven suitable for mapping patient journeys [2]. Here, a patient journey refers to the sequence of touchpoints a patient experiences throughout a healthcare process. An actor² is defined as any person, organization, or digital system involved in the journey. To more accurately represent the range of relevant actors, we propose to nuance and extend CJML’s *Actor* class to explicitly include both healthcare and external actors.

2. Methods

Based on interviews with ten patients—covering chronic conditions, acute illnesses, and a public health vaccination—we identified the actors they encountered throughout their journeys. This informed a patient-centered categorization of actors, which was used to extend the Actor formalism in CJML. The study was approved by the Norwegian Agency for Shared Services in Education and Research (ref. 248882, *Pathway project*).

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² Customer Journey Modeling Language, version 2.0, see <https://cjml.no>

3. Results

Patients reported actors at varying levels of detail, from broad descriptions like “hospital” to specific roles such as “physiotherapist in the neurology department.” This highlighted the need for flexible abstraction levels. Additional requirements included support for both formal and informal names, comprehensive coverage including supporting services, and the representation of physical locations such as waiting rooms and reception areas. The identified categories of actors were: (1) patient’s personal network, (2) healthcare provider, (3) clinical support service, (4) digital health system, (5) general digital system, (6) patient organization and auxiliary service, (7) employer, (8) welfare and social care service, (9) health authority, (10) health registry and quality system, and (11) other.

The *ServiceProvider* class is extended with a *serviceProviderType* attribute to model the main category of actors mentioned by patients, see Figure 1. The categorization of actors is captured in the *SPTypes* enumeration. The *ServiceProvider* class is extended with additional attributes to record information such as legal name, address, physical location, and interactions with healthcare personnel and their roles. The *HealthcareRole* class is used to model roles (e.g., nurse, physician, surgeon) and their descriptions. Informal and formal names mentioned by the patients can be recorded through the existing *Actor.name* and *ServiceProvider.providerName* attributes in the CJML model.

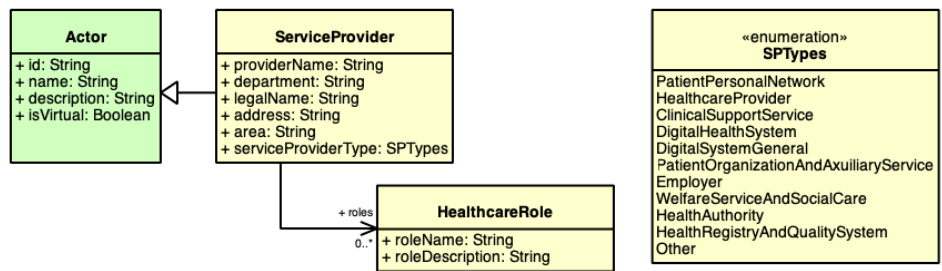


Figure 1. Extending the Actor formalism in CJML for healthcare providers.

4. Discussion and conclusion

Drawing on real patient cases, we have extended the formalism for patient journeys by focusing on the actors that patients themselves report and experience. These actors go beyond healthcare providers to include health portals, welfare services, payment systems, employers, and more—offering a broad perspective essential for capturing the full complexity of patient journeys. This study has limitations: the actor categorization is based on a small sample, and the specificity of the journey types may introduce selection bias. Further validation across a wider range of diagnoses and contexts is needed.

References

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