University Food Policies

DESIGNING SUSTAINABLE FOOD SYSTEMS ON CAMPUS

Edited by
Davide Fassi

DESIGN FOR SYSTEMIC CHANGE

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ISBN e-book Open Access: 9788835193135

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4. A Roadmap Towards Best Practice Enhancement in University Canteens

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ABSTRACT

This chapter presents an empirical study aimed at identifying the best practices for improving university canteen services. Firstly, existing practices within the school canteen system were mapped, with a focus on a case study in the province of Bari. The results of this analysis informed the design of an online, structured questionnaire which was administered to 349 users of the University of Bari Aldo Moro canteens. The questionnaire covered five main areas: quality of food on offer, sensory quality of meals, sustainability, organisation of services and environmental comfort, and interest in additional services. The data were analysed using descriptive statistics and cross-sectional analyses by subgroup, namely gender, age, and area of residence.

The results highlighted specific areas for improvement, namely: improving menu variety and sensory quality; strengthening the sustainability of the supply chain by adopting local and organic production methods; providing incentives for conscious and informed participation through management committees and

nutritional counselling services. Finally, better organisation of the service and greater environmental comfort were found to generate greater user satisfaction.

Overall, the findings provide a solid empirical basis for translating user perceptions into targeted, context-sensitive best practices and support the development of a participatory Manifesto for improving university canteen services.

4.1 Introduction

In recent years, the role of university canteens has progressively evolved from a simple catering service into a strategic component of academic welfare systems, with significant implications in terms of public health, environmental sustainability, and social responsibility. In this context, universities represent privileged environments for the experimentation and implementation of sustainable food models, capable of influencing not only students' dietary habits but also procurement policies and the management of collective catering services (Franchini *et al*., 2023).

With the aim of developing a Manifesto of Best Practices for the improvement of university catering services, with particular attention to their overall sustainability, a study was conducted based on an integrated analysis of existing practices and the direct involvement of end users, acknowledging the central role of students in assessing the quality and impact of the services provided.

4.2 First phase: mapping practices in the school canteen system

The first phase of the study involved mapping the practices adopted within the school canteen system, taking the Province of Bari as a case study. This analysis constituted the knowledge base for the design of a survey instrument addressed to university students, with the aim of exploring perceptions, expectations, and critical issues related to the quality and sustainability of canteen services.

Preliminary focus of the mapping activity was the analysis of the relevant regulatory framework. Public procurement regulation in Italy, including contracts for school and collective catering services, is based on a set of national and European regulations. At the national level, the main reference is the Public Contracts Code (Legislative Decree No. 36/2023), in force since 1 July 2023 and replacing the previous Legislative Decree No. 50/2016. This decree governs procurement procedures for works, services, and supplies, including specific sections dedicated to social services and collective catering (Annex IX). At the European level, the Directive 2014/24/EU establishes the general principles of competition, transparency, and equal treatment (European Parliament, 2014), which have been transposed into the Italian legal system. In addition, contracting authorities frequently rely on guidelines issued by the National Anti-Corruption Authority (ANAC), particularly with regard to transparency and control mechanisms.

A key element for collective catering is represented by the Minimum Environmental Criteria (MECs), defined by the Ministerial Decree of 10 March 2020 (Legislative Decree No. 10/2020). The MECs are mandatory for contracting authorities and establish minimum requirements across three main areas: technical specifications (environmental characteristics of products and services), contractual clauses (obligations for operators, such as the use of detergents bearing the EU Ecolabel), and execution conditions (waste management, energy efficiency, etc.). Among the requirements for food products, minimum percentages of organic products are specified: fruit, vegetables, legumes, and cereals at least 50% by weight; eggs and milk/yogurt 100% organic; cured meats and cheeses at least 30% by weight; extra virgin olive oil at least 40%; peeled and processed tomatoes at least 33%; juices and nectars 100% organic.

In addition to mandatory requirements, the MECs include award criteria that contracting authorities may use to enhance bid evaluation. These include packaging reduction (e.g. water dispensers connected to the public water supply), short supply chains and zero-kilometer products, environmental certifications (REGULATION (EC) No 1221/2009; ISO 14001: 2005), fair trade for exotic products, the use of low-impact vehicle fleets, and the submission of sustainability reports.

Although both school and university catering services refer to the same MEC framework, practical implementation differs according to the characteristics of users and service objectives. Common elements include the obligation to provide minimum percentages of organic food, the use of certified products, and environmental monitoring. Differences instead emerge with regard to nutritional guidelines (more stringent and validated by local health authorities for schools, more flexible in universities), the role of food education (mandatory in schools), portion and food waste control, and award criteria (greater emphasis on short supply chains in schools, and on efficiency and digital effectiveness in universities) (Table 4.1).

Aspect	School catering	University canteens
Users	Children and adolescents (nursery, primary and secondary schools)	Young adults (students, faculty, staff)
Nutritional guidelines	Strictly defined by local health authorities/ Regions (e.g. LARN, MIUR guidelines)	More flexible, often based on free choice via self-service
Rotating menus	Mandatory, validated by dietitians and health authorities	Greater freedom in menu design, fixed or optional choices
Food education	Integrated into the service (educational component)	Not mandatory
Portion and waste control	High attention to waste reduction and balanced meals	Less control; greater user autonomy
Award criteria	Greater emphasis on short supply chains and seasonality	Greater emphasis on efficiency, digital services, flexible schedules

Table 4.1. Differences in the application of regulations between school catering and university canteens.

At the territorial level, the Apulia Region has issued guidelines for collective catering that integrate national MECs, providing additional guidance on food education and sustainability. The Municipality of Bari manages school catering services through a municipal regulation governing enrolment, payments, and exemptions based on income (ISEE). The Municipality of Monopoli has adopted a regulation that explicitly refers to the MECs (Ministerial Decree 10/03/2020 No. 65), emphasizing quality, reduced environmental impact, and working conditions along the supply chain; particularly relevant is City Council Resolution No. 4 of 16 February 2024. These local instruments complement the MECs and require participating companies to adapt their bids and operational practices accordingly.

For companies participating in collective catering tenders in Apulia and in the municipalities considered, the operational implications are clear: strict compliance with national MECs, adherence to regional guidelines (with a focus on health, education, and sustainability), and conformity with municipal regulations.

The mapping of practices adopted within the school canteen system was completed through interviews conducted both with a company contracted to provide school catering services and with school principals from the Municipality of Monopoli, acting as service users.

The company Ferrara Ristorazione provides catering services to 90 school facilities across 12 municipalities in the Province of Bari. At full capacity, the company employs approximately 500 workers and operates 21 cooking centers distributed throughout the province. Among the main challenges highlighted by the company in securing public contracts is the difficulty of simultaneously meeting requirements for organic products and for "zero-kilometer" products (Law 61/2022), defined as agricultural and livestock products originating from production and processing sites located within a radius of no more than 70 kilometers from the place of sale, or within the same province as the place of sale or consumption.

A key strength of Ferrara Ristorazione lies in its ownership of an agricultural enterprise, which allows it to fully meet its demand for fresh organic fruit and vegetables through self-production (Figure 4.1).

Figure 4.1. Taproots of a local variety of carrot (*Dacus carota L.*) called "Carota di San Vito" harvested at "Azienda Agricola Pasquale Ferrara".

For raw materials of animal origin, the company relies on approximately 12 suppliers in order to meet requirements for organic and zero-kilometer products. The company's strategy is based on the exclusive use of organic products (100%), which maximizes scores related to MEC award criteria and simplifies organizational and operational management. Another strength is its consistent focus on both quality and sustainability, ensured through an internal quality control system managed exclusively by in-house staff.

Subsequent interviews with school principals highlighted the importance of continuous monitoring of the service provided. In this regard, the mapping exercise emphasized the relevance and effectiveness of the canteen committee, a consultative and participatory body composed of parents, teachers, and representatives of the local authority, which can report service issues and participate in inspections of cooking centers or dining facilities.

At the end of the mapping phase, a state-of-the-art analysis was conducted on the university canteen service contracted by ADISU Puglia for users of the University of Bari Aldo Moro. The results of this document-based analysis were compared with the information emerging from the mapping of practices adopted in the school canteen system (Table 4.2).

Table 4.2. Differences between school catering and university canteens based on practice mapping and analysis of the ADISU Puglia university canteen service.

Aspect	School catering	University canteens
Users	Children and adolescents (under adult supervision)	Adults autonomous in choice and consumption
Educational involvement	Strong educational focus (healthy eating, schedules, behaviors)	Limited, mainly oriented toward user satisfaction
Service structure	Fixed menus approved by health authorities	Self-service, multiple-choice menus, greater flexibility
Canteen committee	Present and well-structured (parents and teachers)	Rare; feedback mainly through surveys and complaint desks
MEC monitoring	Mandatory and highly detailed (ingredients and origin)	Mandatory, but more focused on supply and logistics
Portion control	Strict, based on age-specific LARN nutritional needs	Flexible; users choose portions and dishes

4.3 Second phase: survey on university canteens

To identify good practices for improving university canteen services, a structured questionnaire was developed and distributed to users of the canteens at the University of Bari Aldo Moro. The questionnaire was completed on a voluntary and anonymous basis. It was divided into five main thematic areas, with perception-related questions formulated using five-point ordinal scales. Dichotomous questions were used to assess interest in additional services. A total of 349 valid and complete questionnaires were obtained.

Descriptive statistics were used to analyse the data, after which a cross-sectional analysis was conducted to highlight differences in perception of service quality according to the age, gender and area of residence of users, enabling the critical interpretation of the data and the identification of good practices (see Figure 4.2).

Figure 4.2. Phases of the direct inquiry.

The results of the cross-sectional analysis (Tables 4.3-5) showed that perception and appreciation of the canteen service is significantly shaped by gender, age and area of residence.

	Women			Men			
Ordinal indicators							
Indicator	**Negative (%)**	**Positive (%)**	**Synthetic evaluation**	**Negative (%)**	**Positive (%)**	**Synthetic evaluation**	**Comparative judgement**
Variety of daily food offerings	41.0	13.3	Negative	42.1	20.0	Negative	Similar
Seasonal products	36.9	22.1	Negative	41.4	22.8	Negative	More negative among men
Local products	51.0	11.8	Negative	46.2	14.5	Negative	More negative among women
Short supply chain (km 0) products	58.3	6.7	Very negative	58.3	6.7	Very negative)	Similar
Organic / integrated farming products	55.8	8.1	Very negative	51.7	7.9	Very negative	Similar
Sensory quality	61.1	7.0	Very negative	42.1	20.0	Negative	More negative among women
Nutritional information	48.4	22.2	Negative	42.1	26.9	Negative	More negative among women
Environmental and ethical sustainability	46.8	13.3	Negative	41.4	15.9	Negative	More negative among women
Sustainability of tableware	41.5	26.1	Negative	36.6	28.3	Moderate	More negative among women
Environmental comfort	36.9	32.7	Moderate	35.9	34.5	Moderate	Similar
Service organisation	49.2	20.4	Negative	44.1	24.1	Negative	More negative among women
Dichotomous indicators							
Indicator	**Yes (%)**	**No (%)**	**Synthetic evaluation**	**Yes (%)**	**No (%)**	**Synthetic evaluation**	**Comparative judgement**
Nutritional tutoring	71.3	28.7	Very favourable	62.1	37.9	Moderate	More favourable among women
Users' representatives participation	92.4	7.6	Very favourable	89.0	11.0	Very favourable	Similar

Table 4.3.
Cross-analysis between gender and perceived quality indicators of the university canteen service.

	≤21 years old			22–25 years old			≥26 years old			
Ordinal indicators										
Indicator	**Negative (%)**	**Positive (%)**	**Synthetic evaluation**	**Negative (%)**	**Positive (%)**	**Synthetic evaluation**	**Negative (%)**	**Positive (%)**	**Synthetic evaluation**	**Comparative judgement**
Variety of daily food offerings	19.6	21.7	Favourable	55.3	13.2	Negative	40.9	27.3	Negative	The most negative 22–25 years old
Seasonal products	38.0	21.7	Negative	45.0	20.0	Negative	31.8	27.3	Moderate	The most negative 22–25 years old
Local products	46.7	14.1	Negative	53.9	10.5	Negative	31.8	27.3	Moderate	The most negative 22–25 years old
Short supply chain (km 0) products	50.0	8.7	Very negative	57.9	5.3	Very negative	36.4	27.3	Moderate	The most negative 22–25 years old
Organic / integrated farming products	47.8	10.9	Negative	56.6	6.6	Very negative	31.8	27.3	Moderate	The most negative 22–25 years old
Sensory quality	56.5	10.9	Negative	60.8	6.6	Very negative	54.5	9.1	Very negative	The most negative 22–25 years old
Nutritional information	39.1	26.1	Negative	49.3	20.4	Negative	31.8	36.4	Favourable	The most favourable ≥26 years old
Environmental and ethical sustainability	34.8	26.1	Moderate	46.1	17.1	Negative	45.5	18.2	Negative	The most negative 22–25 years old
Sustainability of tableware	39.1	30.4	Moderate	43.4	25.0	Negative	31.8	36.4	Favourable	The most favourable ≥26
Environmental comfort	43.5	28.3	Negative	35.5	32.9	Moderate	31.9	36.5	Favourable	The most favourable ≥26 years old
Service organisation	52.2	18.5	Negative	44.7	21.1	Negative	44.4	22.2	Negative	The most negative ≤21 years old
Dichotomous indicators										
Indicator	**Yes (%)**	**No (%)**	**Synthetic evaluation**	**Yes (%)**	**No (%)**	**Synthetic evaluation**	**Yes (%)**	**No (%)**	**Synthetic evaluation**	**Comparative judgement**
Nutritional tutoring	60.9	39.1	Moderate	67.3	32.7	Moderate	81.8	18.2	Very favourable	The most favourable ≥26 years old
Users' representatives participation	91.3	8.7	Very favourable	90.8	9.2	Very favourable	90.9	9.1	Very favourable	Similar

Table 4.4.
Cross-analysis between age groups and perceived quality indicators of the university canteen service.

	Urban area			Rural area			
Ordinal indicators							
Indicator	**Negative (%)**	**Positive (%)**	**Synthetic evaluation**	**Negative (%)**	**Positive (%)**	**Synthetic evaluation**	**Comparative judgement**
Variety of daily food offerings	41.2	16.8	Negative	44.1	17.6	Negative	Similar
Seasonal products	38.1	22.5	Negative	50.0	17.6	Negative	Rural people the more negative
Local products	48.5	14.4	Negative	58.8	8.8	Very negative	Rural people the more negative
Short supply chain (km 0) products	53.9	7.4	Very negative	67.6	5.9	Very negative	Rural people the more negative
Organic / integrated farming products	52.8	8.3	Very negative	67.6	5.9	Very negative	Rural people the more negative
Sensory quality	58.4	9.6	Very negative	61.8	8.8	Very negative	Similar
Nutritional information	44.9	24.6	Negative	47.1	23.5	Negative	Similar
Environmental and ethical sustainability	44.6	15.0	Negative	58.8	11.8	Negative	Rural people the more negative
Sustainability of tableware	36.9	29.2	Moderate	58.8	11.8	Negative	Rural people the more negative
Environmental comfort	38.4	31.3	Moderate	32.4	35.3	Very favourable	Rural people the more favourable
Service organisation	49.4	21.8	Negative	44.1	26.5	Negative	Urban people more negative
Dichotomous indicators							
Indicator	**Yes (%)**	**No (%)**	**Synthetic evaluation**	**Yes (%)**	**No (%)**	**Synthetic evaluation**	**Comparative judgement**
Nutritional tutoring	67.0	33.0	Moderate	70.0	30.0	More favourable	Rural people the more favourable
Users' representatives participation	91.1	8.9	Very favourable	91.2	8.8	Very favourable	Similar

Table 4.5.
Cross-analysis between area of residence and perceived quality indicators of the university canteen service.

The sensory quality of meals and the variety of daily food options emerged as critical structural issues affecting all analysed subgroups. Overall, these two characteristics received low ratings, highlighting systemic weaknesses in the canteen service. The combined perception of a limited menu and poor sensory quality reduces satisfaction with the dining experience and undermines the educational and preventive role of university catering, i.e. its ability to encourage healthy eating habits and prevent diet-related diseases (Chang *et al*., 2014; Kourouniotis *et al*., 2016; Garg and Kumar, 2017; Li *et al*., 2022).

A stronger difference in perception of sustainability indicators (seasonality, locality, short supply chains, organic/integrated farming products, and ethical and environmental issues) was observed among users from different territorial contexts, and to a lesser extent among users of different genders.

Users from rural areas were more critical overall, highlighting a substantial gap between their expectations and their perception of the quality of the service.

This suggests that sustainability is assessed not only on the basis of actual service provision, but also in comparison with territorial food models that are perceived as being more authentic, coherent and transparent (Akbara *et al*., 2021; Son, 2024; Del Gaudio *et al*., 2024; Aboueldahab *et al*., 2026).

Female users exhibited greater evaluative severity across several environmental and ethical dimensions and were more attentive to the value-based implications of food choices. These differences highlight that perceptions of sustainability are significantly shaped by gender, reflecting cultural orientations that are more closely linked to environmental responsibility, health, collective well-being, and the ethical quality of food choices. These value systems attribute not only a nutritional function to food, but also a social and moral one (Schaubroeck *et al*., 2018; Pandey *et al*., 2023; Manzano Fischer *et al*., 2026).

Appreciation of the service organisation is strongly influenced by age. Younger users tend to be more critical, particularly regarding waiting times, queue management and perceived efficiency. As age increases, evaluations progressively improve, suggesting either an adaptation effect or a different organisational tolerance threshold. This pattern indicates that the organisation of services is a particular-

ly sensitive issue for younger users, for whom the canteen is embedded in daily routines characterised by tight time constraints and high organisational pressure (Garg & Kumar, 2017; Czarniecka-Skubina *et al*., 2019; Roy *et al*., 2019).

Similarly, satisfaction with the clarity of the nutritional information provided increased with the age of respondents. However, an overall negative trend suggests that informational transparency is a structural weakness of the service, independent of socio-demographic characteristics. Insufficient information limits users' ability to make informed food choices, reducing the educational potential of the university canteen as a health promotion tool (Hilger *et al*., 2017; Czarniecka-Skubina *et al*., 2019; Cooreman-Algoed *et al*., 2020; Bonito *et al*., 2026). The evaluation of environmental comfort is strongly influenced by the area of residence. Urban residents were less satisfied, whereas rural residents gave more favourable evaluations. This suggests that comfort assessments depend on everyday environments (Serhan & Serhan, 2019; Rahman, 2024).

Interest in the involvement of users to monitor the efficiency and quality of the canteen service is extremely high and consistent across all subgroups, as participation is perceived as a collective and stable need among users. According to a logic of public service co-production, the canteen is not only a service to be evaluated, but also a space that can potentially be co-governed by users (Wongprawmas *et al*., 2023).

Interest in nutritional tutoring increases progressively with age, suggesting a growing awareness of food throughout the university experience. This demonstrates the educational potential of the university canteen, which could be further enhanced throughout the entire university career (Sogari *et al*., 2018).

Overall, the cross-sectional analysis shows that the perception of the university canteen service is not a single, static judgement, but a dynamic, stratified and socially constructed phenomenon. The observed differences reflect the interaction between individual characteristics, the cultural context and the organisational structure of the service. This evidence confirms the need for a modular improvement model that can adapt to diverse user profiles and is differentiated to address specific needs. It should also be participa-

tory to enhance users' active role and integrated to connect quality, sustainability, and food education (Wongprawmas *et al*., 2023; Franchini *et al*., 2023).

4.4 Good practices for enhancing the university canteen service

The results of the cross-sectional analysis allowed us to define a set of operational good practices aimed at improving the quality of the university canteen service, which are suitable for inclusion in a 'Manifesto'. These practices are organised into eight strategic areas, each of which addresses a critical issue identified in the analysed sample. The objective is to transform the university canteen into an integrated space for sustainability, food education and participation, thereby increasing user satisfaction (Franchini *et al*., 2023; Blennerhassett *et al*., 2025).

1. *Improving menu variety and quality*

Menu variety is perceived as insufficient by over 40% of users. Menu repetitiveness reduces service attractiveness and may compromise adherence to a balanced diet.

Operational good practices:

- planning seasonal menus with genuine weekly rotation;
- systematic introduction of regional and traditional dishes;
- daily availability of vegetarian, vegan, and special-diet options;
- user involvement in periodic menu selection;
- experimentation with themed menus and gastronomic weeks.

Increasing variety enhances satisfaction, nutritional diversity, and reduces food waste.

2. *Strengthening short supply chains and sustainability*

Over 50% of users evaluate the presence of local, organic/integrated farming, and short supply chain products negatively, indicating a strong misalignment between expectations and service perception.

Operational good practices:

- establishing agreements with local agricultural producers;
- transparent communication of product origin;
- use of visual labels to indicate local and sustainable products;
- monitoring raw material traceability.

Strengthening short supply chains reduces environmental impact, supports local economies, and increases user trust.

3. *Improving sensory quality*

Sensory quality represents a major critical issue, with nearly 60% of negative evaluations.

Operational good practices:

- continuous training of kitchen staff;
- review of cooking and storage techniques;
- periodic control of food temperature and texture;
- introduction of internal quality audits;
- tasting panels involving users.

Improved sensory quality directly affects dish acceptability and waste reduction.

4. *Improving clarity of nutritional information*

Almost half of users judge nutritional information as unclear or insufficient.

Operational good practices:

- simplified nutritional sheets with intuitive icons;
- clear indication of allergens and energy values;
- QR codes for access to detailed information;
- use of non-technical, accessible language;
- integration with food education campaigns.

Informational transparency supports informed choices and protects user health.

5. *Optimising service organisation*

Service organisation is negatively evaluated by nearly 50% of users.

Operational good practices:

- digital meal booking systems;
- rescheduling service time slots;
- dynamic queue management;
- monitoring average waiting times.

Improved organisation enhances perceived efficiency and overall satisfaction.

6. *Improving environmental comfort*

Environmental comfort is predominantly rated as moderate.

Operational good practices:

- increasing seating capacity;

- improving and monitoring cleanliness and maintenance;
- creating differentiated functional areas;
- improving lighting and acoustics;
- ergonomic adjustment of furnishings.

Environmental comfort significantly contributes to overall service quality perception.

7. *Active user involvement*

Approximately 90% of users desire active representation in service management.

Operational good practices:

- establishing a canteen user committee;
- structured periodic consultations;
- digital feedback systems;
- public reporting of results;
- user involvement in decision-making processes.

Participation strengthens sense of belonging and managerial transparency.

8. *Introduction of nutritional tutoring service*

Approximately 67% of users support the introduction of nutritional tutoring.

Operational good practices:

- periodic presence of nutritionists in the canteen;
- information desks;
- support for special diets;
- educational workshops;
- integration with university health services.

Nutritional tutoring transforms the canteen into an educational as well as catering environment.

4.5 Conclusions

This study provides a comprehensive and empirical assessment of how university canteen services are perceived by users, showing that such perceptions are shaped by the interaction between individual characteristics, socio-cultural context and service organisation.

The cross-sectional analysis identified specific critical indicators – especially limited menu variety and poor sensory quality – as structural weaknesses of the service, which were reported across gender, age groups and areas of residence. These issues undermine the users' satisfaction and weaken the educational and preventive role of university canteens, understood as their capacity to promote healthy dietary habits and contribute to the prevention of diet-related diseases.

Sustainability-related indicators (e.g. seasonal and local products, short supply chains, organic and integrated farming products, and ethical aspects) were evaluated more critically by users from rural areas and, to a lesser extent, by female users. This suggests that sustainability perceptions are strongly mediated by territorial food cultures and gender-related values, which attribute social, ethical and environmental functions to food. Service organisation emerged as a generational issue, with younger users expressing greater dissatisfaction, while older users report more favourable evaluations, possibly reflecting adaptive behaviours or different tolerance thresholds.

Nutritional information revealed a structural deficit in informational transparency.

At the same time, the study highlighted strong demand for participation and nutritional tutoring. A large share of respondents supported the introduction of users' representation, and interest in nutritional tutoring increased with age, pointing to a significant yet underexploited educational and social potential of university canteens.

The best practices identified are directly connected with these findings. Structural interventions are justified where criticalities are transversal (e.g. sensory quality, menu variety and nutritional transparency), while socio-demographic variability in other dimensions (e.g. sustainability, comfort and organisation) calls for flexible and context-sensitive strategies.

The results confirm that improving university canteen services requires a modular, differentiated and participatory governance approach, capable of transforming the canteens into a strategic space for health promotion, sustainability education and active citizenship.

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