

A modern approach to supporting the dynamic institution

An overview of Oracle Student's dynamic-entity architecture

December 2022, Version 2.1
Copyright © 2023, Oracle
Public

Purpose statement

This document provides an overview of features and enhancements included in iterative releases starting in 2023. It is intended solely to help you assess the business benefits of adopting Oracle Student and to plan your I.T. projects.

Disclaimer

This document in any form, software or printed matter, contains proprietary information that is the exclusive property of Oracle. Your access to and use of this confidential material is subject to the terms and conditions of your Oracle software license and service agreement, which has been executed and with which you agree to comply. This document and information contained herein may not be disclosed, copied, reproduced or distributed to anyone outside Oracle without prior written consent of Oracle. This document is not part of your license agreement nor can it be incorporated into any contractual agreement with Oracle or its subsidiaries or affiliates.

This document is for informational purposes only and is intended solely to assist you in planning for the implementation and upgrade of the product features described. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described in this document remains at the sole discretion of Oracle. Due to the nature of the product architecture, it may not be possible to safely include all features described in this document without risking significant destabilization of the code.

Table of contents

Purpose statement	2
Disclaimer	2
Introduction	4
Evolving the SIS to support the modern student	4
<i>Expanding beyond multi-org and multi-institution</i>	5
<i>Evaluating the limitations of past and current models</i>	6
Embracing the future with Oracle Student’s dynamic entity vision	6
<i>Enabling flexibility with Oracle’s architectural frameworks</i>	7
Supporting various organizational structures with Oracle Student’s dynamic entity architecture	8
<i>Inherited governance and sharing</i>	8
<i>Independence at high-level entities</i>	9
<i>Peer-to-peer entity sharing</i>	9
<i>Independence at low-level entities</i>	9
Conclusion	10

Introduction

Higher education stands on the precipice of a radical transformation, with traditional institutional boundaries becoming more porous, collaborative, and exponentially expansive. The types of educational and academic models that institutions deliver – and how, where, when, and why students choose to embrace them – will be more varied, and unpredictable than ever before. Students are transferring, deferring, and experimenting with different types of traditional and non-traditional academic programs: an exciting, adaptive approach that extends the possibilities of the educational experience.

To keep pace with these changes, Oracle is investing in a more modern, bold approach to our next-generation student information system (SIS), Oracle Student. With its intelligent tools, smart automation, and purpose-built architectural frameworks, Oracle Student makes the complex simple and empowers institutions and students. At its core is our revolutionary **dynamic entity**¹ architecture, which will allow customers to manage legal, financial, and academic independence and sharing, across and among entities, within a single SIS instance in flexible and unrestrained ways.

Oracle Student supports a wider range of structures beyond that of the traditional top-down governance model of the institutional system, accommodating additional structures like consortia and complex institutions. Its flexibility – to manage independence at all entity levels or peer-to-peer sharing across entities – enables innumerable use cases, such as course-sharing in an academic network or consortium, maintaining the unique properties of a professional school within a complex institution, consolidating institutions, and more.

This adaptive and configurable framework will deliver continuous value for our customers, thanks to its ability to evolve with and facilitate our customers' strategic objectives for teaching, learning, and research – without compromising data integrity and security or requiring substantive reworking of the SIS. As a result, Oracle Student's dynamic entity framework approach will spark new, agile ways for educators to collaborate with each other and improve student outcomes.

Evolving the SIS to support the modern student

While much about the future is uncertain, it is clear that current and prospective students are deeply concerned about many facets of their educational experience: its affordability, its accessibility, its ability to serve as a stepping-stone for professional success, and even its overall value. These concerns have manifested themselves in the demonstrated drop in enrollment, transfers, and retention in the 2020/2021 and 2021/2022 academic years: effects of the COVID-19 pandemic that will continue to reverberate throughout the next decade or longer.² It is not unreasonable to predict that in the future, many students will – either by choice or necessity – pursue their education at more than one institution, “stop-out” or pause their education, or explore a range of non-traditional and traditional academic offerings contiguously or even simultaneously.

Institutions will need to ensure their own flexibility in a variety of ways: provide a wide spectrum of academic offerings to attract and retain students; facilitate a smoother transition for students into or out of their institution; reduce overhead; and collaborate more extensively with other institutions in their network (such as a **consortium**³

¹ An **entity** is a unit used to denote constituents, data, and programs in an organizational structure. Entities might be grouped together for legal, financial, and academic sharing purposes, or might be standardized as legally or academically independent. Examples of common entities include schools, academic programs, campuses, institutional systems, and consortia.

² Undergraduate decline data from National Student [Clearinghouse Research Center](#); The [Chronicle of Higher Education](#) reports that over 1200 schools have closed or consolidated from 2014-2018.

³ In a **consortium**, schools might share an enterprise system or allow academic cross-enrollment for certain courses, but are legally, financially, and academically independent, and data sharing is limited.

or **institutional system**⁴) to enable the first three options. To achieve these goals, institutions must reconsider the capabilities of their SIS.

Expanding beyond multi-org and multi-institution

In order to address the challenges of new business models and student expectations, the student system must empower the student to have agency over their own journey. This is in stark opposition to the more static, linear education model of previous decades still facilitated by current SISs, which were created with an administrative or transactional perspective in mind. Oracle’s design philosophy is that a modern student system must reflect this evolution to a more flexible and adaptive lens, where the SIS can act as a catalyst for institutional innovation and student-directed learning journeys.

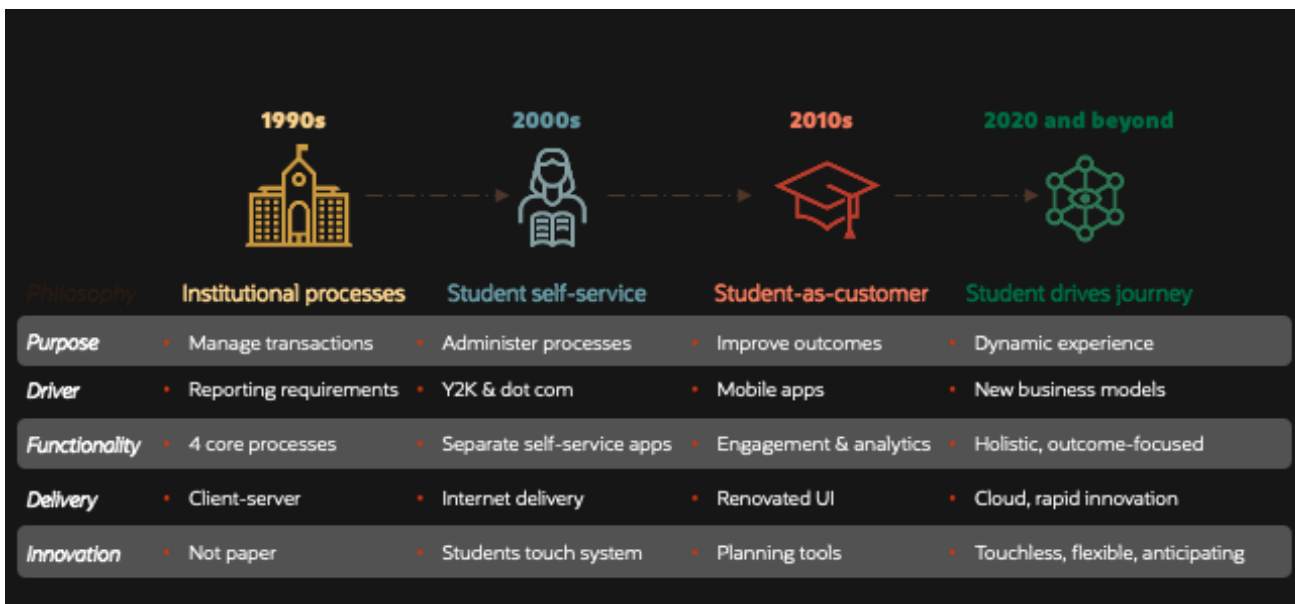


Image Caption 1. Oracle’s vision for Oracle Student is to create a truly student-centric system.

Accordingly, the SIS’s approach to managing entities – capabilities enabling legal, financial, and academic independence and sharing – must also evolve. Current SISs use a “multi-org” or “multi-institution” model, which is primarily hierarchical and codifies the business organization or institution entity as the highest level. Multi-org and multi-institution essentially emulates the rigidity of higher education in the 1990s and 2000s: they are often hard-coupled by the vendor to specific parent entities (such as an institution or business organization), and only facilitate independence and sharing for common use cases. Due to this inflexible architectural structure, multi-institution cannot easily accommodate other models such as a consortium, **branch campus system**,⁵ or a **complex institution with professional schools**⁶ – and even has severe limitations for its most common use case, the **institutional system**. For example, if an institutional system is using multi-institution within a single SIS instance, the member institutions would be forced to share some governance and academic policies. As a result, users might find themselves unwantedly adapting their governance policies and organizational structures to fit

⁴ In a **system**, a group of institutions share a legal and financial affiliation and are governed by a central office or board of regents or trustees for matters of funding, compliance, policy development, and state reporting.

⁵ In a **branch campus system**, individual schools within a system are characterized as affiliated campuses, not autonomously administered institutions. This configuration is similar to that of an institutional system, except that each school lacks academic, financial or legal independence, and transferring from one campus to another is a common process.

⁶ Professional schools – business schools, law schools, medical schools, etc. – are generally affiliated with a larger, **complex institution** (which in turn might be a member of a consortium or system). These schools typically have legal, financial, and academic independence from other schools within the institution: they might maintain control of their own funding and staffing, or have distinct regulatory requirements that might require extra data security requirements or specific technology integrations.

the vendor's static model, rather than being able to innovate on their own terms and provide a dynamic experience for their students.

Evaluating the limitations of past and current models

Multi-institution generally assumes top-level governance and focuses on supporting differentiation (i.e., independence) among institutions and colleges within a standard institutional system. While hierarchical structures are assumed to be relatively independent from one another, this approach results in a static, top-down approach where lower-level entities are generally forced to inherit structures and policies from the highest entity. In the previous multi-institution example, the individual institutions within an institutional system inherit many academic, legal, and financial structures from the central office, regardless of their unique governance structures.

Multi-institution's lack of agility to fully support other organizational models (like a complex institution, a branch campus system, or a consortium) is a severe limitation for the higher ed industry: according to an Inside Higher Ed survey, 85% of provosts plan to increase collaboration with other colleges and universities over the next year.⁷ In an era where differentiating academic programs and the student experience is key to survival, the calcification of institutional structures and governance is a profound weakness in current student systems – and hinders institutions who are trying to pursue innovation.

85% of provosts plan to increase collaboration with other institutions in the next year.

Embracing the future with Oracle Student's dynamic entity vision

Oracle Student's dynamic entity framework is designed to upend the limitations of past models and empower the future of higher education. Our dynamic entity framework extends beyond multi-institution to provide multi-entity support, allowing institutions to efficiently and securely modify their SIS alongside their evolving institutional structures. With dynamic entity, users in a single SIS instance can manage legal, financial, and academic independence and sharing at all entity levels within the same organizational hierarchy (such as top-down governance from an institution to its individual colleges) or across peer hierarchies (such as sharing between two colleges within a consortium) – however, whenever, and wherever they want.

Because Oracle Student allows users to configure sharing (as seen in the examples in the previous paragraph) and independence among entities (such as professional schools in a complex institution), customers can maintain legal, financial, and academic independence when necessary and share data, setup, and configuration when advantageous.⁸ In doing so, customers within a single SIS instance can pursue new forms of governance and collaboration across a variety of organizational models like consortia, academic programs, and more. This dynamic entity capability embodies Oracle Student's promise to make the complex simple: for example, a college could belong to both an institutional system and a consortium without precipitating unmanageable complexity, if they are on the same SIS instance.

73% of CIOs see reducing institutional expenses as a top priority.

Moving to a single instance of an administrative system helps institutions streamline operational costs and staff responsibilities: an increasingly judicious move, given the massive budgetary, staffing, and technical issues that many customers currently face.⁹ In fact, 73% of university CFOs rate reducing their institution's expenses as a top priority.¹⁰ Yet an even greater reward than cost reduction is the newfound ability to embrace innovation.

Undertaking major structural changes at an institution is undoubtedly costly and complicated, but Oracle

⁷Inside Higher Ed's [2021 Chief Academic Officer Survey](#)

⁸ Whether institutions opt to consolidate their administrative systems in lieu of consolidating their institutional services or academic offerings, the work needed to enact the former establishes many of the processes necessary for the latter: standardizing data definitions and business processes, increasing consistency across different organizations, etc.

⁹ [The Center on Budget and Policy Priorities'](#) federal and state budget data; the [Chronicle of Higher Education](#) reports that one out of eight jobs in higher ed were lost last during the 2020-2021 academic year.

¹⁰ [Kaufman Hall's](#) 2019 CFO Outlook survey.

Student’s dynamic entity framework will make it easier to navigate those changes without requiring reimplementa-tion or a sizeable project – and will more easily accommodate new, dynamic student experiences.

Enabling flexibility with Oracle’s architectural frameworks

Oracle Student’s ability to support dynamic entity rests on two core architectural concepts: **dynamic attribute association** and **soft-coupling of entities**.

With dynamic attribute association, customers have the full flexibility to assign configuration and attributes (such as persons, data, processes, and setup) that can be isolated or shared among one or more entities within an organizational structure.¹¹ Given this newfound capacity to update their configuration and attributes during or after implementation, customers can more easily manage structural change. For example, a consortium sharing a single SIS instance can choose what attributes will be shared or isolated (such as its schools, academic programs, or faculty) and can add other institutions as members in the future.

Soft-coupling of entities is a new approach that does not assume organizational structures and entity associations in a single SIS instance will remain static after their initial configuration. Instead, Oracle Student’s soft-coupled entity structure allows customers to easily change their organizational structure in their SIS to closely match their desired organizational changes, and have its associated configuration and attributes persist and update automatically.¹² In the previous example, a new consortium member’s ability to share specific academic courses or staff with other institutions in the consortium, without heavy programmatic intervention, is due to soft-coupling.

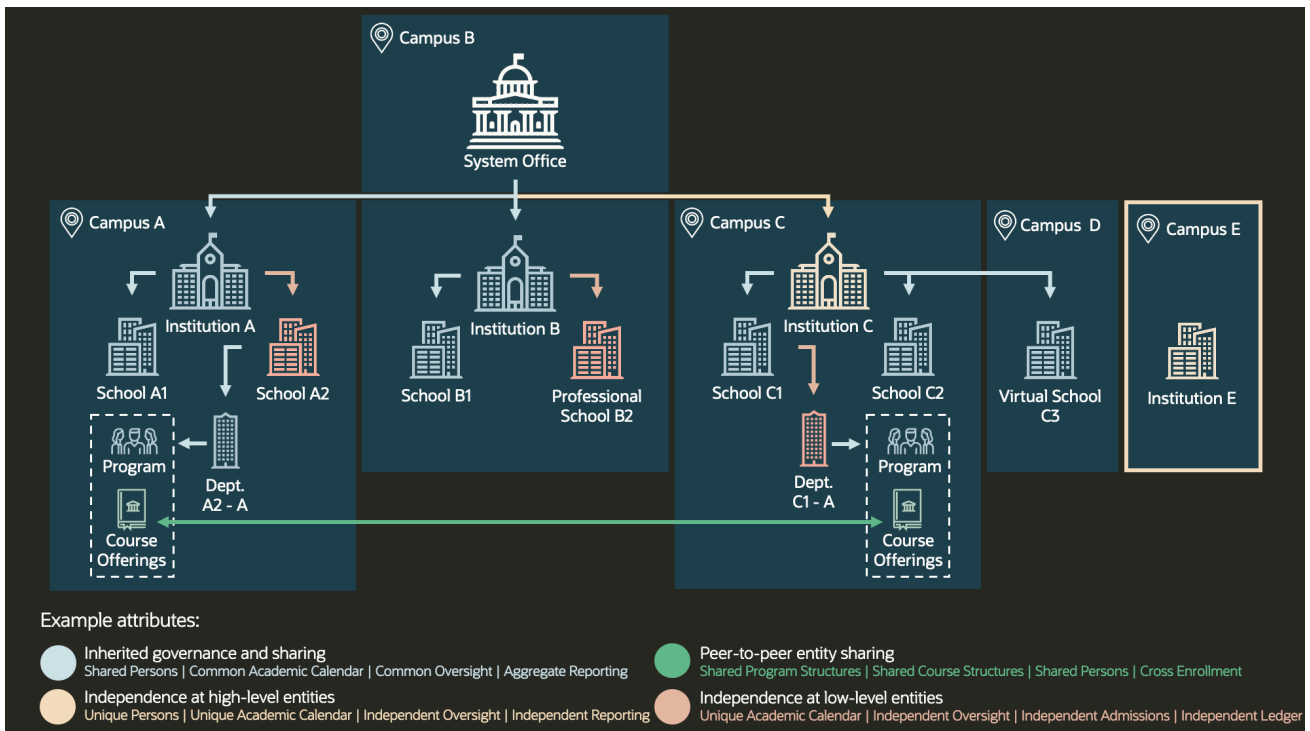


Image Caption 2. This is an example highlighting the four common structural models that will be supported by Oracle Student’s dynamic entity framework: inherited governance and sharing; independence at high-level entities; peer-to-peer entity sharing; independence at low-level entities.

¹¹ Most existing student information systems allow customers to associate configuration and attributes to one or more entities within a single SIS instance at implementation. However, the available entities to associate configuration and attributes to is often limited to vendor-codified use cases and does not extend to all functional capabilities and entities. These attribute and data association to an entity is most often enabled during implementation, so updating entity attribute and data associations after implementation requires regression work.

¹² Similarly to the previous footnote, existing SISs allow customers to configure their entity structure and parent/child hierarchies, but the parent entities and data that can be associated to entity types are often limited to vendor-codified use cases. Entity associations are most often enabled statically during implementation, so updating these configurations afterwards requires regression work.

To showcase how Oracle Student's dynamic entity framework will manage complex organizational structures and permit rapid change of those structures, the diagram above explores how an independent institution might navigate its merger with a nearby institutional system:

- Impacted by an economic downturn, a struggling institution (Institution A) suffered budget cuts and reduced enrollment. In an effort to capture operational efficiencies and remain viable, they negotiated a deal to be acquired and merged into a nearby institutional system. As part of the merger, Institution A will adopt as much of the governance and policies (its academic calendar, admissions policies, and aggregate reporting requirements) as possible from the system office, as also seen in the system's flagship, Institution B (indicated by the light blue arrows). With Oracle Student as their SIS, the institutional system can use its inherited governance and sharing capabilities to rapidly stand up the newly-merged Institution A, which will take advantage of dynamic attribute association to inherit data, setup, and processing rules from the system office (as indicated by the light blue arrow).
- The newly merged Institution A undertakes an exercise with the institutional system office to determine areas where they can change their curriculum offerings to reduce redundancies, focus on their strengths, and benefit from the strengths of other member institutions. The system office identifies that a program in the School of Humanities at Institution A had experienced reduced enrollment, as did a similar program in Institution C's School of Arts and Sciences. To gain operational efficiencies, Institution A and Institution C take advantage of Oracle Student's peer-to-peer entity sharing capability to share faculty, staff, governance, and courses. This allows students to cross-enroll in those specific programs within their institution's respective schools (as designated by the green arrows).
- For an example of independence at a low-level entity, the flagship Institution B has a law school (Professional School B2) that is legally associated to the institution, but is academically and financially independent. Oracle Student allows the law school to maintain its own unique data, setup, and processing rules by dynamically overriding the entity inheritance from its parent institution, Institution A (indicated by the pink arrow).
- While it belongs to the institutional system, Institution C, an institution in an international location, maintains separate governance and policies from the system office and other institutions, demonstrating Student Cloud's capability to permit independence for a higher-level entity (as indicated by the light brown arrow).
- For another example of inherited governance and sharing, the independent Institution C also maintains an online campus (Campus D), where one of its virtual schools (C3) inherits resources, such as faculty, course programs, and students from Institution C (as designated by the blue arrow).
- Institution E is an independent institution that belongs to a consortium with Institution B. Even though it is not part of the system, it is able to take advantage of Oracle Student's ability to support multi-tenancy to achieve greater operational efficiencies. As a consortia member, Institution E represents independence at a high-level entity, as it remains fully independent, maintaining complete autonomy for its academic, financial, legal governance and policies (as represented by the light brown outline around the institution).

Supporting various organizational structures with Oracle Student's dynamic entity architecture

This section goes into greater detail of the ways in which Oracle Student's dynamic entity capabilities play out in the diagram's four structural models: **inherited governance**, **independence at high-level entities**, **peer-to-peer entity sharing**, and **independence at low-level entities**. Unlike traditional SISs (in which updating entity configurations and associations requires regression work), Oracle Student enables these structural models to evolve alongside its customers, who can dynamically change their entity configurations and associations during and after implementation, and have their changes persist automatically. As a result, Oracle Student customers can significantly expand their institutions' capacity for change in more flexible, efficient ways: collaborate in a consortium, manage merging with another institution, change governance policies, and more.

Inherited governance and sharing

Oracle Student's dynamic entity framework will utilize configuration to allow for full, partial, or no inherited sharing of all lower-level entities in an organizational hierarchy. Unlike in traditional SISs, where sharing of data,

setup, and processes is primarily inherited from the higher-level entities and does not extend across all functional capabilities (e.g., using the multi-institution model), Oracle Student empowers customers to choose what lower-level entities can inherit from their parent entities and what to keep unique. Furthermore, unlike multi-institution, where the institution is the highest-level entity, Oracle Student customers can configure a broader variety of entities in an organizational structure to serve as high-level parent entities (such as a system office, consortia office, institution, college, campus) that can bequeath governance and policies with lower-level entities (such as a school or academic department).

For example, an institutional system with a currently independent institution hierarchy decides to restructure itself as a branch campus system in which governance and policies will be shared. The institutions could dynamically re-associate their configurations and attributes to directly inherit governance and policies from the system office as applicable. Going forward, any changes to inherited configurations would only need to be made once at the system office level, and not individually by each institution.

Independence at high-level entities

Oracle Student will enable flexibility for high-level entities within a single SIS instance. Customers can configure a variety of entities in an organizational structure as high-level parent entities (such as a system office, consortia office, institution, college, campus) and have complete control over what is kept as unique and what is shared between these entities. This is counter to most SISs, where entity hierarchies can generally only override the shared system configuration in vendor-codified use cases, and not holistically across all configurations. For example, independent institutions within a consortium often are unable to override the hierarchical governance and academic policies codified by the vendor.

Using Oracle Student, individual institutions in a consortium could fully control their level of independence, including the ability to create and maintain unique persons and identifiers specific to each institution, if desired. The consortium's institutional members could maintain their own unique governance, policies, person records, etc., while still gaining the operational efficiencies of being on a single SIS.

Peer-to-peer entity sharing

Oracle Student will support peer-to-peer entity sharing within an organizational hierarchy. In this structural model, entities can share persons, data, setup, and processes with other peer entities (such as schools at two separate institutions) in a single SIS instance, regardless of whether the entities are at the same level or in the same hierarchy.

For example, two institutions in the same system opt to share faculty, staff, governance, and courses for humanities programs due to declining enrollment. These institutions could efficiently re-associate all configurations and data to directly share certain courses and persons, while keeping all other programs independent. Any changes to shared configurations and rules can happen dynamically, and would only need to be made once by the owning school and not individually by each school.

Independence at low-level entities

Oracle Student will enable not just independence at high-level entities but also independence at all low-level or child entities (e.g., schools) in an organizational hierarchy. Customers can select certain lower-level entities within a single SIS instance to inherit some attributes from its parent entities, but can maintain independence for other configuration and attributes, regardless of their level in the hierarchy. As a result, entities at any level in a hierarchy can dynamically override the entity inheritance and maintain their own unique governance and policies across capabilities.

For example, a business school (the lower-level entity within the hierarchy of the parent entity, the institution) has the flexibility and freedom to maintain their own unique academic policies without being subject to the governance of the parent institution.

Conclusion

Oracle Student's dynamic entity architecture represents our strategic vision for the future of higher education. We believe that our industry's success and sustainability depend upon the ability to deliver a wide array of educational experiences and student outcomes. To accomplish this requires student systems with the agility to build and re-build a diverse array of organizational models and academic structures. It requires, in other words, student systems with dynamic, flexible, and broad entity capabilities.

Dynamic entity – and the more innovative business processes and structures that it empowers – can create endless possibilities for institutions. It can bring about a culture of collaboration, from sharing academic programs and course offerings across a network of institutions to providing a broader array of traditional and non-traditional academic models and credentials. And it can do so while still enabling operational efficiency on a single SIS instance.

Of course, the future of dynamic entity can encompass broader networks of collaboration and sharing beyond the single SIS instance. We envision a world in which institutions can support a vast array of organizational and business models and student journeys, such as course-sharing programs, transfer articulation agreements, or standardized admissions hubs across a loosely affiliated network or region. In doing so, institutions can actualize the promise of higher education: to help all students achieve their academic, personal, and professional goals.

Our design philosophy for Oracle Student is rooted in the idea of “complex made simple”: better tools, pervasive automation, and frameworks to spark institutional transformation and facilitate rapid, continuous change. We invite you to partner with us on your own dynamic entity-driven journey, and take part in this reimagining of higher education.

Connect with us

Call +1.800.ORACLE1 or visit [oracle.com](https://www.oracle.com). Outside North America, find your local office at: [oracle.com/contact](https://www.oracle.com/contact).

 blogs.oracle.com

 facebook.com/oracle

 twitter.com/oracle

Copyright © 2023, Oracle and/or its affiliates. All rights reserved. This document is provided for information purposes only, and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document, and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group. 0120

Disclaimer: If you are unsure whether your data sheet needs a disclaimer, read the revenue recognition policy. If you have further questions about your content and the disclaimer requirements, e-mail REVREC_US@oracle.com.