|  |  |  |
| --- | --- | --- |
| Ký hiệu nhóm: |  |  |
| **STT** | **Mã sinh viên** | **Họ và tên** |
| 21 | KTPM2211050 | Lê Văn Hào |
| 7 | KTPM2211014 | Trần Gia Bảo |
| 1 | KTPM2211052 | Trần Quốc An |

1. Mô hình ERD

A diagram of a computer program

AI-generated content may be incorrect.

1. File XML
   1. Có thể dùng 2 file: 1 dành cho DTD và 1 dành cho XSD
   2. Dữ liệu thực tế, mỗi thực thể chính phải có ít nhất 7 dòng dữ liệu.

XML cho XSD

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        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

        xsi:schemaLocation="https://www.w3schools.com mxh.xsd">

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    <email>ktpm2211052@ctu.edu.vn</email>

    <matkhau>p1</matkhau>

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    <gioitinh>nu</gioitinh>

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    <mota>Cộng đồng game thủ</mota>

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    <author\_id>102</author\_id>

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XML cho DTD

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    <email>ktpm2211052@ctu.edu.vn</email>

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    <email>ktpm2211037@ctu.edu.vn</email>

    <matkhau>p6</matkhau>

    <ngaytao>2025-09-27T09:00:00</ngaytao>

    <trangthai>1</trangthai>

    <tenhienthi>Trịnh Bảo Khang</tenhienthi>

    <avatar>ktpm2211037.png</avatar>

    <bio>SV KTPM2211037</bio>

    <ngaysinh>2004-04-09</ngaysinh>

    <gioitinh>nam</gioitinh>

  </user>

  <user>

    <user\_id>107</user\_id>

    <email>ktpm2211027@ctu.edu.vn</email>

    <matkhau>p7</matkhau>

    <ngaytao>2025-09-27T11:11:00</ngaytao>

    <trangthai>1</trangthai>

    <tenhienthi>Nguyễn Phát Tài</tenhienthi>

    <avatar>ktpm2211027.png</avatar>

    <bio>SV KTPM2211027</bio>

    <ngaysinh>2004-04-25</ngaysinh>

    <gioitinh>nam</gioitinh>

  </user>

  <!--  GROUP  -->

  <group>

    <group\_id>201</group\_id>

    <tennhom>CTU Dev</tennhom>

    <mota>Lập trình viên Cần Thơ</mota>

    <chedo>cong\_khai</chedo>

    <owner\_id>101</owner\_id>

    <ngaytao>2025-09-26T10:00:00</ngaytao>

  </group>

  <group>

    <group\_id>202</group\_id>

    <tennhom>Design Hub</tennhom>

    <mota>Giao diện sáng tạo</mota>

    <chedo>cong\_khai</chedo>

    <owner\_id>102</owner\_id>

    <ngaytao>2025-09-26T11:00:00</ngaytao>

  </group>

  <group>

    <group\_id>203</group\_id>

    <tennhom>Game Talk</tennhom>

    <mota>Cộng đồng game thủ</mota>

    <chedo>ban\_be</chedo>

    <owner\_id>103</owner\_id>

    <ngaytao>2025-09-26T12:00:00</ngaytao>

  </group>

  <group>

    <group\_id>204</group\_id>

    <tennhom>Photo Club</tennhom>

    <mota>Nhiếp ảnh sinh viên</mota>

    <chedo>cong\_khai</chedo>

    <owner\_id>104</owner\_id>

    <ngaytao>2025-09-26T13:00:00</ngaytao>

  </group>

  <group>

    <group\_id>205</group\_id>

    <tennhom>Data Team</tennhom>

    <mota>Phân tích dữ liệu</mota>

    <chedo>bi\_mat</chedo>

    <owner\_id>105</owner\_id>

    <ngaytao>2025-09-27T09:30:00</ngaytao>

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  <group>

    <group\_id>206</group\_id>

    <tennhom>Runner</tennhom>

    <mota>Chạy bộ mỗi ngày</mota>

    <chedo>ban\_be</chedo>

    <owner\_id>106</owner\_id>

    <ngaytao>2025-09-27T10:00:00</ngaytao>

  </group>

  <group>

    <group\_id>207</group\_id>

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    <chedo>cong\_khai</chedo>

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  </group>

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  <group\_detail>

    <group\_membership\_id>301</group\_membership\_id>

    <group\_id>201</group\_id>

    <user\_id>101</user\_id>

    <vaitro>admin</vaitro>

    <trangthai>active</trangthai>

    <ngaythamgia>2025-09-26T10:05:00</ngaythamgia>

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    <group\_id>201</group\_id>

    <user\_id>102</user\_id>

    <vaitro>member</vaitro>

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    <vaitro>admin</vaitro>

    <trangthai>active</trangthai>

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    <trangthai>active</trangthai>

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    <group\_id>204</group\_id>

    <user\_id>104</user\_id>

    <vaitro>admin</vaitro>

    <trangthai>active</trangthai>

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    <trangthai>active</trangthai>

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    <group\_id>206</group\_id>

    <user\_id>106</user\_id>

    <vaitro>admin</vaitro>

    <trangthai>active</trangthai>

    <ngaythamgia>2025-09-27T10:05:30</ngaythamgia>

  </group\_detail>

  <!--  POST  -->

  <post>

    <post\_id>901</post\_id>

    <author\_id>101</author\_id>

    <noidung>Xin chao moi nguoi</noidung>

    <chedohienthi>cong\_khai</chedohienthi>

    <ngaytao>2025-09-27T14:00:00</ngaytao>

    <capnhat>2025-09-27T14:05:00</capnhat>

  </post>

  <post>

    <post\_id>902</post\_id>

    <author\_id>102</author\_id>

    <noidung>Figma tips</noidung>

    <chedohienthi>ban\_be</chedohienthi>

    <ngaytao>2025-09-27T15:00:00</ngaytao>

    <capnhat>2025-09-27T15:10:00</capnhat>

  </post>

  <post>

    <post\_id>903</post\_id>

    <author\_id>103</author\_id>

    <noidung>Game hay</noidung>

    <chedohienthi>cong\_khai</chedohienthi>

    <ngaytao>2025-09-27T16:00:00</ngaytao>

    <capnhat>2025-09-27T16:10:00</capnhat>

  </post>

  <post>

    <post\_id>904</post\_id>

    <author\_id>104</author\_id>

    <noidung>Bo suu tap anh</noidung>

    <chedohienthi>cong\_khai</chedohienthi>

    <ngaytao>2025-09-27T17:00:00</ngaytao>

    <capnhat>2025-09-27T17:20:00</capnhat>

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  <post>

    <post\_id>905</post\_id>

    <author\_id>105</author\_id>

    <noidung>Phan tich du lieu</noidung>

    <chedohienthi>riêng\_tư</chedohienthi>

    <ngaytao>2025-09-27T18:00:00</ngaytao>

    <capnhat>2025-09-27T18:05:00</capnhat>

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  <post>

    <post\_id>906</post\_id>

    <author\_id>106</author\_id>

    <noidung>Chay 5km</noidung>

    <chedohienthi>ban\_be</chedohienthi>

    <ngaytao>2025-09-27T19:00:00</ngaytao>

    <capnhat>2025-09-27T19:05:00</capnhat>

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  <post>

    <post\_id>907</post\_id>

    <author\_id>107</author\_id>

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    <chedohienthi>cong\_khai</chedohienthi>

    <ngaytao>2025-09-27T20:00:00</ngaytao>

    <capnhat>2025-09-27T20:10:00</capnhat>

  </post>

  <!--  COMMENT  -->

  <comment>

    <comment\_id>5001</comment\_id>

    <post\_id>901</post\_id>

    <author\_id>102</author\_id>

    <noidung>Chao ban!</noidung>

    <ngaytao>2025-09-27T14:06:00</ngaytao>

  </comment>

  <comment>

    <comment\_id>5002</comment\_id>

    <post\_id>901</post\_id>

    <author\_id>103</author\_id>

    <noidung>Welcome</noidung>

    <parent\_comment\_id>5001</parent\_comment\_id>

    <ngaytao>2025-09-27T14:07:00</ngaytao>

  </comment>

  <comment>

    <comment\_id>5003</comment\_id>

    <post\_id>902</post\_id>

    <author\_id>101</author\_id>

    <noidung>Hay do</noidung>

    <ngaytao>2025-09-27T15:12:00</ngaytao>

  </comment>

  <comment>

    <comment\_id>5004</comment\_id>

    <post\_id>903</post\_id>

    <author\_id>104</author\_id>

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  <comment>

    <comment\_id>5005</comment\_id>

    <post\_id>904</post\_id>

    <author\_id>105</author\_id>

    <noidung>Dep qua</noidung>

    <ngaytao>2025-09-27T17:22:00</ngaytao>

  </comment>

  <comment>

    <comment\_id>5006</comment\_id>

    <post\_id>906</post\_id>

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    <post\_id>907</post\_id>

    <author\_id>106</author\_id>

    <noidung>Cam on</noidung>

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  </comment>

  <!--  FOLLOW  -->

  <follow>

    <follow\_id>801</follow\_id>

    <follower\_id>101</follower\_id>

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    <tranthai>chap\_nhan</tranthai>

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  <follow>

    <follow\_id>802</follow\_id>

    <follower\_id>102</follower\_id>

    <followee\_id>101</followee\_id>

    <tranthai>chap\_nhan</tranthai>

    <ngaytao>2025-09-26T09:05:00</ngaytao>

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  <follow>

    <follow\_id>803</follow\_id>

    <follower\_id>103</follower\_id>

    <followee\_id>101</followee\_id>

    <tranthai>cho\_duyet</tranthai>

    <ngaytao>2025-09-26T10:00:00</ngaytao>

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  <follow>

    <follow\_id>804</follow\_id>

    <follower\_id>104</follower\_id>

    <followee\_id>103</followee\_id>

    <tranthai>chap\_nhan</tranthai>

    <ngaytao>2025-09-26T11:00:00</ngaytao>

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  </follow>

  <!--  REACTION  -->

  <reaction>

    <reaction\_id>6001</reaction\_id>

    <reactor\_id>101</reactor\_id>

    <target\_type>bai\_viet</target\_type>

    <target\_post\_id>901</target\_post\_id>

    <loaituongtac>thich</loaituongtac>

    <thoigian>2025-09-27T14:06:10</thoigian>

  </reaction>

  <reaction>

    <reaction\_id>6002</reaction\_id>

    <reactor\_id>102</reactor\_id>

    <target\_type>binh\_luan</target\_type>

    <target\_comment\_id>5001</target\_comment\_id>

    <loaituongtac>tym</loaituongtac>

    <thoigian>2025-09-27T14:06:20</thoigian>

  </reaction>

  <reaction>

    <reaction\_id>6003</reaction\_id>

    <reactor\_id>103</reactor\_id>

    <target\_type>bai\_viet</target\_type>

    <target\_post\_id>902</target\_post\_id>

    <loaituongtac>wow</loaituongtac>

    <thoigian>2025-09-27T15:13:00</thoigian>

  </reaction>

  <reaction>

    <reaction\_id>6004</reaction\_id>

    <reactor\_id>104</reactor\_id>

    <target\_type>bai\_viet</target\_type>

    <target\_post\_id>903</target\_post\_id>

    <loaituongtac>care</loaituongtac>

    <thoigian>2025-09-27T16:13:00</thoigian>

  </reaction>

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    <target\_type>bai\_viet</target\_type>

    <target\_post\_id>904</target\_post\_id>

    <loaituongtac>thich</loaituongtac>

    <thoigian>2025-09-27T17:23:00</thoigian>

  </reaction>

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    <reaction\_id>6006</reaction\_id>

    <reactor\_id>106</reactor\_id>

    <target\_type>binh\_luan</target\_type>

    <target\_comment\_id>5006</target\_comment\_id>

    <loaituongtac>cuoi</loaituongtac>

    <thoigian>2025-09-27T19:06:30</thoigian>

  </reaction>

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    <reaction\_id>6007</reaction\_id>

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    <target\_post\_id>907</target\_post\_id>

    <loaituongtac>wow</loaituongtac>

    <thoigian>2025-09-27T20:12:30</thoigian>

  </reaction>

</mangxh>

1. DTD

<!ELEMENT mangxh (user\*, group\*, group\_detail\*, post\*, comment\*, follow\*, reaction\*)>

<!-- user -->

<!ELEMENT user (user\_id, email, matkhau, ngaytao, trangthai, tenhienthi, avatar?, bio?, ngaysinh?, gioitinh?)>

<!ELEMENT user\_id (#PCDATA)>

<!ELEMENT email (#PCDATA)>

<!ELEMENT matkhau (#PCDATA)>

<!ELEMENT ngaytao (#PCDATA)>

<!ELEMENT trangthai (#PCDATA)>

<!ELEMENT tenhienthi (#PCDATA)>

<!ELEMENT avatar (#PCDATA)>

<!ELEMENT bio (#PCDATA)>

<!ELEMENT ngaysinh (#PCDATA)>

<!ELEMENT gioitinh (#PCDATA)>

<!-- group -->

<!ELEMENT group (group\_id, tennhom, mota?, chedo, owner\_id, ngaytao)>

<!ELEMENT group\_id (#PCDATA)>

<!ELEMENT tennhom (#PCDATA)>

<!ELEMENT mota (#PCDATA)>

<!ELEMENT chedo (#PCDATA)>

<!ELEMENT owner\_id (#PCDATA)>

<!ELEMENT ngaytao (#PCDATA)>

<!-- group\_detail -->

<!ELEMENT group\_detail (group\_membership\_id, group\_id, user\_id, vaitro, trangthai, ngaythamgia)>

<!ELEMENT group\_membership\_id (#PCDATA)>

<!ELEMENT vaitro (#PCDATA)>

<!ELEMENT ngaythamgia (#PCDATA)>

<!-- post -->

<!ELEMENT post (post\_id, author\_id, noidung, chedohienthi, ngaytao, capnhat?)>

<!ELEMENT post\_id (#PCDATA)>

<!ELEMENT author\_id (#PCDATA)>

<!ELEMENT noidung (#PCDATA)>

<!ELEMENT chedohienthi (#PCDATA)>

<!ELEMENT capnhat (#PCDATA)>

<!-- comment -->

<!ELEMENT comment (comment\_id, post\_id, author\_id, noidung, parent\_comment\_id?, ngaytao)>

<!ELEMENT comment\_id (#PCDATA)>

<!ELEMENT parent\_comment\_id (#PCDATA)>

<!-- follow -->

<!ELEMENT follow (follow\_id, follower\_id, followee\_id, tranthai, ngaytao)>

<!ELEMENT follow\_id (#PCDATA)>

<!ELEMENT follower\_id (#PCDATA)>

<!ELEMENT followee\_id (#PCDATA)>

<!ELEMENT tranthai (#PCDATA)>

<!-- reaction -->

<!ELEMENT reaction (reaction\_id, reactor\_id, target\_type, target\_post\_id?, target\_comment\_id?, loaituongtac, thoigian)>

<!ELEMENT reaction\_id (#PCDATA)>

<!ELEMENT reactor\_id (#PCDATA)>

<!ELEMENT target\_type (#PCDATA)>

<!ELEMENT target\_post\_id (#PCDATA)>

<!ELEMENT target\_comment\_id (#PCDATA)>

<!ELEMENT loaituongtac (#PCDATA)>

<!ELEMENT thoigian (#PCDATA)>

1. XSD

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targetNamespace="https://www.w3schools.com"

xmlns="https://www.w3schools.com"

elementFormDefault="qualified">

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<xs:simpleType name="idInt">

<xs:restriction base="xs:integer"/>

</xs:simpleType>

<xs:simpleType name="genderEnum">

<xs:restriction base="xs:string">

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</xs:restriction>

</xs:simpleType>

<xs:simpleType name="chedoNhom">

<xs:restriction base="xs:string">

<xs:enumeration value="cong\_khai"/>

<xs:enumeration value="ban\_be"/>

<xs:enumeration value="bi\_mat"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="chedoHienThi">

<xs:restriction base="xs:string">

<xs:enumeration value="cong\_khai"/>

<xs:enumeration value="ban\_be"/>

<xs:enumeration value="riêng\_tư"/>

</xs:restriction>

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<xs:restriction base="xs:string">

<xs:enumeration value="admin"/>

<xs:enumeration value="mod"/>

<xs:enumeration value="member"/>

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<xs:simpleType name="trangThaiEnum">

<xs:restriction base="xs:string">

<xs:enumeration value="active"/>

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<xs:enumeration value="blocked"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="followTrangThai">

<xs:restriction base="xs:string">

<xs:enumeration value="chap\_nhan"/>

<xs:enumeration value="cho\_duyet"/>

<xs:enumeration value="chan"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="reactionEnum">

<xs:restriction base="xs:string">

<xs:enumeration value="thich"/>

<xs:enumeration value="wow"/>

<xs:enumeration value="tym"/>

<xs:enumeration value="tuc\_gian"/>

<xs:enumeration value="buon"/>

<xs:enumeration value="cuoi"/>

<xs:enumeration value="care"/>

</xs:restriction>

</xs:simpleType>

<xs:simpleType name="targetTypeEnum">

<xs:restriction base="xs:string">

<xs:enumeration value="bai\_viet"/>

<xs:enumeration value="binh\_luan"/>

</xs:restriction>

</xs:simpleType>

<!-- Root -->

<xs:element name="mangxh">

<xs:complexType>

<xs:sequence>

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<xs:element name="group" type="groupType" minOccurs="0" maxOccurs="unbounded"/>

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<xs:element name="post" type="postType" minOccurs="0" maxOccurs="unbounded"/>

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</xs:sequence>

</xs:complexType>

<!-- Keys -->

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<xs:field xpath="user\_id"/>

</xs:key>

<xs:key name="group\_key">

<xs:selector xpath="group"/>

<xs:field xpath="group\_id"/>

</xs:key>

<xs:key name="membership\_key">

<xs:selector xpath="group\_detail"/>

<xs:field xpath="group\_membership\_id"/>

</xs:key>

<xs:key name="post\_key">

<xs:selector xpath="post"/>

<xs:field xpath="post\_id"/>

</xs:key>

<xs:key name="comment\_key">

<xs:selector xpath="comment"/>

<xs:field xpath="comment\_id"/>

</xs:key>

<xs:key name="follow\_key">

<xs:selector xpath="follow"/>

<xs:field xpath="follow\_id"/>

</xs:key>

<xs:key name="reaction\_key">

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<!-- Foreign keys -->

<xs:keyref name="group\_owner\_fk" refer="user\_key">

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<xs:keyref name="follow\_follower\_fk" refer="user\_key">

<xs:selector xpath="follow"/>

<xs:field xpath="follower\_id"/>

</xs:keyref>

<xs:keyref name="follow\_followee\_fk" refer="user\_key">

<xs:selector xpath="follow"/>

<xs:field xpath="followee\_id"/>

</xs:keyref>

<xs:keyref name="reaction\_user\_fk" refer="user\_key">

<xs:selector xpath="reaction"/>

<xs:field xpath="reactor\_id"/>

</xs:keyref>

<xs:keyref name="reaction\_post\_fk" refer="post\_key">

<xs:selector xpath="reaction"/>

<xs:field xpath="target\_post\_id"/>

</xs:keyref>

<xs:keyref name="reaction\_comment\_fk" refer="comment\_key">

<xs:selector xpath="reaction"/>

<xs:field xpath="target\_comment\_id"/>

</xs:keyref>

</xs:element>

<!-- Complex types -->

<xs:complexType name="userType">

<xs:sequence>

<xs:element name="user\_id" type="idInt"/>

<xs:element name="email" type="xs:string"/>

<xs:element name="matkhau" type="xs:string"/>

<xs:element name="ngaytao" type="xs:dateTime"/>

<xs:element name="trangthai" type="xs:byte"/>

<xs:element name="tenhienthi" type="xs:string"/>

<xs:element name="avatar" type="xs:string" minOccurs="0"/>

<xs:element name="bio" type="xs:string" minOccurs="0"/>

<xs:element name="ngaysinh" type="xs:date" minOccurs="0"/>

<xs:element name="gioitinh" type="genderEnum" minOccurs="0"/>

</xs:sequence>

</xs:complexType>

<xs:complexType name="groupType">

<xs:sequence>

<xs:element name="group\_id" type="idInt"/>

<xs:element name="tennhom" type="xs:string"/>

<xs:element name="mota" type="xs:string" minOccurs="0"/>

<xs:element name="chedo" type="chedoNhom"/>

<xs:element name="owner\_id" type="idInt"/>

<xs:element name="ngaytao" type="xs:dateTime"/>

</xs:sequence>

</xs:complexType>

<xs:complexType name="groupDetailType">

<xs:sequence>

<xs:element name="group\_membership\_id" type="idInt"/>

<xs:element name="group\_id" type="idInt"/>

<xs:element name="user\_id" type="idInt"/>

<xs:element name="vaitro" type="vaiTroEnum"/>

<xs:element name="trangthai" type="trangThaiEnum"/>

<xs:element name="ngaythamgia" type="xs:dateTime"/>

</xs:sequence>

</xs:complexType>

<xs:complexType name="postType">

<xs:sequence>

<xs:element name="post\_id" type="idInt"/>

<xs:element name="author\_id" type="idInt"/>

<xs:element name="noidung" type="xs:string"/>

<xs:element name="chedohienthi" type="chedoHienThi"/>

<xs:element name="ngaytao" type="xs:dateTime"/>

<xs:element name="capnhat" type="xs:dateTime" minOccurs="0"/>

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</xs:complexType>

<xs:complexType name="commentType">

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<xs:element name="comment\_id" type="idInt"/>

<xs:element name="post\_id" type="idInt"/>

<xs:element name="author\_id" type="idInt"/>

<xs:element name="noidung" type="xs:string"/>

<xs:element name="parent\_comment\_id" type="idInt" minOccurs="0"/>

<xs:element name="ngaytao" type="xs:dateTime"/>

</xs:sequence>

</xs:complexType>

<xs:complexType name="followType">

<xs:sequence>

<xs:element name="follow\_id" type="idInt"/>

<xs:element name="follower\_id" type="idInt"/>

<xs:element name="followee\_id" type="idInt"/>

<xs:element name="tranthai" type="followTrangThai"/>

<xs:element name="ngaytao" type="xs:dateTime"/>

</xs:sequence>

</xs:complexType>

<xs:complexType name="reactionType">

<xs:sequence>

<xs:element name="reaction\_id" type="idInt"/>

<xs:element name="reactor\_id" type="idInt"/>

<xs:element name="target\_type" type="targetTypeEnum"/>

<xs:element name="target\_post\_id" type="idInt" minOccurs="0"/>

<xs:element name="target\_comment\_id" type="idInt" minOccurs="0"/>

<xs:element name="loaituongtac" type="reactionEnum"/>

<xs:element name="thoigian" type="xs:dateTime"/>

</xs:sequence>

</xs:complexType>

</xs:schema>